



## Protests, Reflecting Turmoil in U.S. Church, Await John Paul

New York Times Service

**NEW YORK** — People who admire Pope John Paul II, people who do not, and people who see a chance to make a buck have all geared up for the pope's 10-day cross-country tour, which begins Thursday when he steps off a jetliner called "Shepherd One" at Miami International Airport.

For millions, the U.S. tour will be a peak of their spiritual life, a chance to see the Holy Father, the successor to Peter, the leader of 840 million Roman Catholics around the world.

People angry with the pope are also preparing for his visit.

Women, priests, homosexuals, blacks, Hispanics and other groups of Catholics are planning to let the pope know what is on their minds, through demonstrations or through prepared statements.

Several minorities within the church, such as black and Hispanic Catholics, feel the church needs to be more sensitive to their cultures and give them a larger voice.

The messages all these groups plan to deliver reflect the turmoil within the broader American church. Large numbers of the United States' 52 million Catholics disagree with the church's stands on birth control, homosexuality and the ordination of women, among other issues.

The pope is unquestionably aware of such grievances, but the groups see his visit as a special opportunity to dramatize their messages again.

Women's groups have already started demonstrating at the Vatican's diplomatic mission in Washington. These protests will continue in Washington and along the pope's route.

Homosexual rights groups in San Francisco will demonstrate against the Vatican's 1986 statement that homosexuality is "an intrinsic moral evil."

Jews not mollified by the meeting Sept. 1 in Rome between Jewish leaders and the pope are planning protests in Miami and San Francisco.

Meanwhile, entrepreneurs have blanketed the papal route with "I Saw Pope John Paul" T-shirts and buttons, as well as more unusual fare, such as a \$55 water sprinkler in the shape of the pontiff ("Let Us Spray") and \$1.79 pope masks, complete with miter.

One national organizer estimates that 20 million

people will see the pope at motorcades, football stadiums, auditoriums and cathedrals.

In Florida, the pontiff's one-day stay, which includes a few minutes with President Ronald Reagan, will cost, at a conservative estimate, \$5.5 million, or nearly \$4,000 a minute, church officials say. Archdiocese spokesmen say the only public money involved is for security.

For those making the preparations, the trip is a logistical nightmare, covering 9 cities in 10 days, as well as a quick excursion into Canada's Northwest Territories.

Highways will be turned into giant parking lots. Office workers will be sent home early. Schools will be shut for the day. Field hospitals will be set up by the dozens, water stations by the hundreds and portable toilets by the thousands.

John Paul, in his effort to reassert the orthodoxy of the Roman Catholic Church, has made his views known on most of the issues that have been roiling for years inside the American church. But that does not deter many of the groups that await him.

"We believe essentially that the church can change and the pope can change, and that the pope will be open to ideas if we can get his attention," said Sister Jeanne Grammick, a member of the board of the Coalition of American Nuns, who has been urging the church to ordain women as priests.

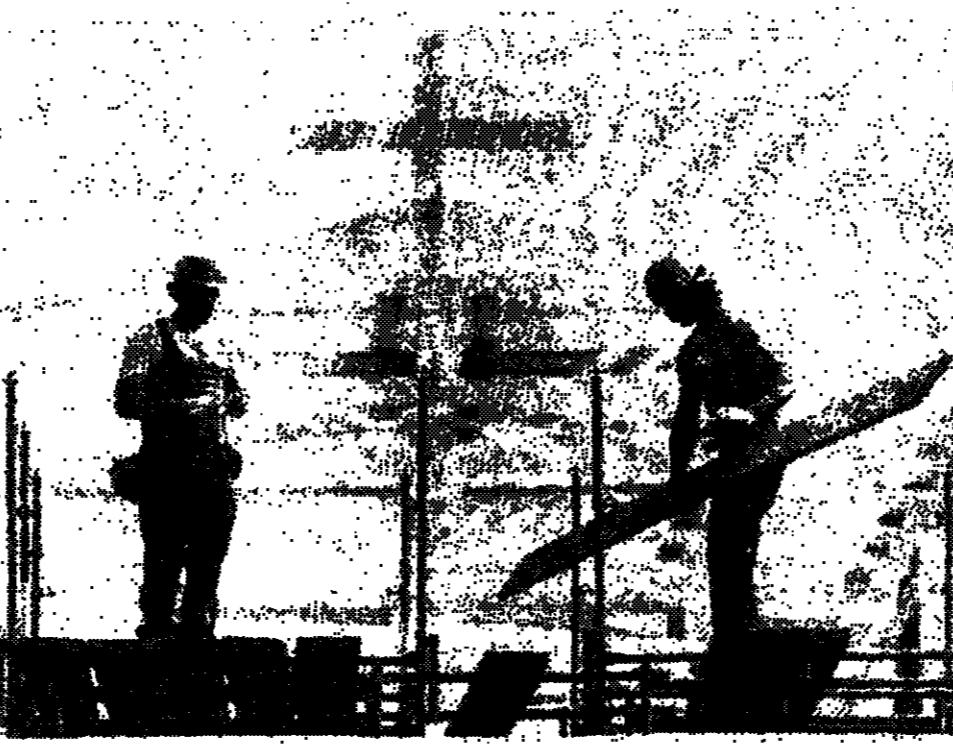
"If you take the long historical view," she added, "you realize that the church has changed over the centuries, but it takes a long time."

The status of women in the church is one of the most widely debated issues among American Catholics. A sizable number of American Catholic women, perhaps a majority, say they are displeased that women are excluded from key roles.

The church teaches that Jesus, whose apostles were men, reserved the priesthood for men.

"Women's ordination is the crux of a lot of issues," said Sister Jeanne. "We can't be in decision-making in the church because that's closed to you."

Mary E. Hunt, a theologian who is co-director of Women's Alliance for Theology, Ethics and Ritual, argues that because women are excluded from the priesthood, their experience cannot be brought to bear on the church's positions on abortion, birth control



Workers in Hamtramck, Michigan, preparing for the pope's visit to the Detroit area.

and surrogate motherhood, all of which the church opposes.

In San Antonio, Los Angeles and Miami, the pope will be seen by large numbers of Hispanic Catholics.

The Reverend Vincent O. Lopez, associate director for Hispanic Affairs of the national bishops' conference, says a primary concern is the success that Pentecostals, evangelicals and other Christian groups are having in proselytizing among the 17 million Hispanic Catholics in the United States.

Ethnic sensitivity is also a dominant issue for the nation's 1.3 million black Catholics. James P. Lyke of Cleveland, an auxiliary bishop, says blacks are trying to win acceptance of traditions including hymn borrowed from black Baptists and a more emotional worship style.

Other concerns of black Catholics include a desire for more black priests and bishops. Among the nation's 11 black bishops, only one, Bishop Joseph L. Howze of Biloxi, Mississippi, heads his own diocese.

## Reagan, Rousing Finish In Mind, Lists His Goals

By Martin Tolchin

New York Times Service

**WASHINGTON** — President Ronald Reagan, saying he wants to end with a "good curtain call," has outlined his agenda for his remaining 16 months in office. He set as his primary domestic goal the Senate's confirmation of Judge Robert H. Bork to the Supreme Court.

At a meeting Tuesday of senior administration officials, Mr. Reagan said that his other priorities included an arms control agreement with the Soviet Union, the restoration of "true democracy" in Nicaragua, a budget-balancing constitutional amendment, the right to veto specific budget items while approving the rest of a bill and an "economic bill of rights" that would stress turning over some government activities to the private sector.

The president was silent, however, on some topics at the heart of the conservative agenda on social issues. These include a proposed congressional ban on federal funds for abortion, a constitutional amendment to allow officially sponsored prayer in public schools and a revision of welfare laws that would give



Prime Minister Ingvar Carlsson of Sweden met Wednesday with President Reagan, the first visit by a Swedish leader to the White House since Tage Erlander in 1961.

the states greater latitude in administering funds.

Mr. Reagan said he hoped that the rest of his term would reflect a show-business maxim: "The whole philosophy was, when you come to town, open big. And now, well, it's time for an even bigger finish, and a good curtain call."

"On the domestic side," he said, reading from a prepared text, "we face one more important task, and no more important task. I should say, than securing the confirmation of the Supreme Court of Judge Robert Bork."

Mr. Reagan predicted "a tough fight" but said, "I'm convinced that in the end he will be confirmed."

The president was equally emphatic about his commitment to continued aid to the rebels fighting the government in Nicaragua, despite opposition on Capitol Hill.

"We will not accept a mere semblance of democracy," he said. "We got to this point through efforts of the over 15,000 freedom fighters struggling, and some of them dying, for freedom for their country."

The president noted that the United States was engaged in "intensive negotiations" with the Soviet Union on arms control, which he said "hold out the hope of actually cutting both sides' nuclear arsenals."

Marlin Fitzwater, the White House spokesman, said it is "very

likely" that Eduard A. Shevardnadze, the Soviet foreign minister, will meet with Mr. Reagan when he comes to the United States later this month for a meeting with Secretary of State George P. Shultz.

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## OPINION

## INTERNATIONAL HERALD TRIBUNE

## Status Quo for Germans

Erich Honecker is visiting West Germany, the first East German leader to do so. Not long ago that would have been unthinkable. Now the visit, while historic, seems perfectly natural. It demonstrates that after decades of political conflict the two Germans have come to accept the status quo: a divided Germany, with a special relationship between the two states and with both playing central roles in opposing alliances.

Neither Washington nor Moscow tried to stand in the way. They, too, have grown comfortable with the broad outlines of the status quo. This opens the way for the relationship between the two Germans to evolve in practical and humane ways without upsetting the European balance.

The bonds between these two states are as thick as blood — as Mr. Honecker's itinerary shows. He is visiting his sister in his old hometown. This is the sort of tie that keeps the idea of reunification very much alive in West Germany; indeed, that idea is embedded in the constitution there.

Yet no one is more aware than the West German leadership of the qualms that reunification raises, particularly in the rest of Europe. Thus the West German chancellor, Helmut Kohl, speaks to Mr. Honecker of taking down the Berlin Wall, whose construction Mr. Honecker directed, yet Mr. Kohl hardly believes that the wall, or the division it symbolizes, will soon disappear.

— THE NEW YORK TIMES

## Bad Times for Gadhafi

It has been fortunately, a bad summer for Moammar Gadhafi. Chad, a country which the Libyan leader has tormented for years, spent August reducing his army and prestige to tatters. Showing that its victory of last March was no freak, the government of Hissene Habre took back the disputed Aozou border strip that Libya had annexed 14 years earlier. Chad then carried the war to Libyan soil for the first time, devastating a base from which Colonel Gadhafi had launched his depredations.

It is the case that Chad's armed forces had help in becoming more than the ragtag band of one of the more impoverished and tribally divided countries in Africa. The French, playing a discreet and useful patron's role, have armed and trained their former colony's forces and have kept some of their own men and forces on the ground as well. The United States has provided lesser amounts of military aid. Still, there need be no apologies: All of this foreign stiffening did no more than put Chad in a position to defend itself against a government that is led by a certified rogue and is armed, massively, by the Soviet Union.

The war has produced its own black hu-

— THE WASHINGTON POST

## Greenspan Tightens Up

Alan Greenspan, the new chairman of the Federal Reserve Board, took a necessary first step on Friday when the board raised interest rates by half a percentage point. For nearly a month since he took office there had been much speculation in the financial markets whether he would dare to tighten up. A presidential election campaign is getting under way, and high interest is not popular. But the dollar's exchange rate was falling, and fears of inflation were rising. That is why the Federal Reserve acted. The next question is whether an increase of half a point is enough to hold the dollar steady.

It is certainly not going to be enough if President Reagan cannot end the deadlock with Congress over the budget for the fiscal year that begins in three weeks. Under present policy, the Congressional Budget Office has persuasively warned, the federal budget deficit is about to start upward again. A bigger budget deficit is a force for more consumption, drawing more imports into the U.S. market and increasing the other deficit — the one in the foreign trade accounts.

There is a direct relationship between the two deficits. They have soared upward together in the last five years, and they are going to have to come down together.

If they come down, Mr. Greenspan can relax. The pressure will be off. But if they stay high, the dollar will continue to be in

— THE WASHINGTON POST

## Overdue Tennis Lesson

For years John McEnroe screamed and cursed his way through tennis matches, and the craven tennis establishment gave in. Last weekend, in the person of a 22-year-old Australian umpire named Richard Ings, the sport finally grew some self-respect and struck back. For the right ending. It was the best thing that had happened to decent behavior in years.

Mr. McEnroe was up a set and service break in his third-round U.S. Open match against Slobodan Zivojinovic of Yugoslavia, and serving for the second set at 5-3, when he had what he regarded as several hard calls. He lost the game and his self-control, and went into his familiar tirade at the expense of Mr. Ings, who was in the chair.

The officials on whom Mr. McEnroe has heaped such abuse in the past have often been amateurs, local volunteers whom he

— THE WASHINGTON POST

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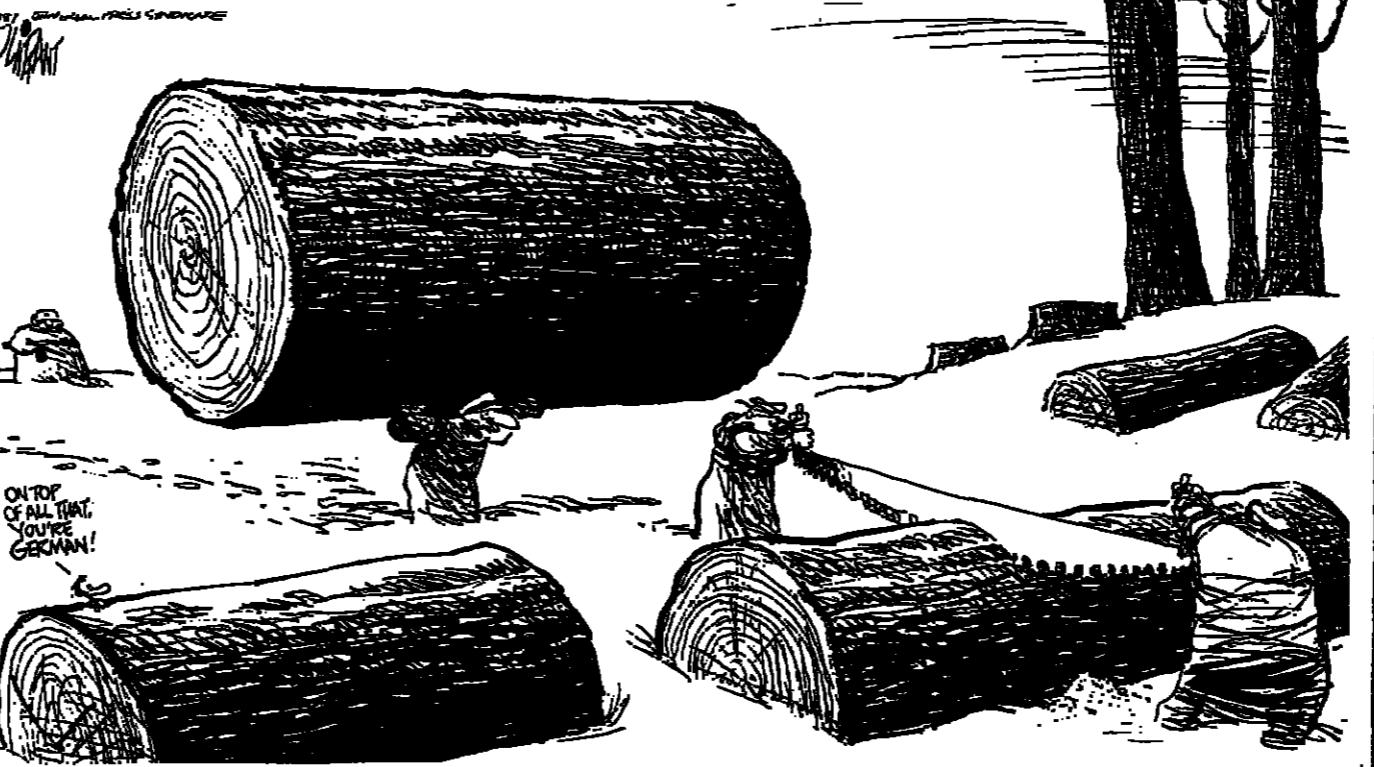
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'Look at the bright side. You fly into Red Square, you make their defense system look ridiculous, you infuriate the military and everyone else — and you still only get four years!'

## An International Trusteeship Might Rescue Haiti

By Arthur Schlesinger Jr.

**N**EW YORK — What a collection of fakes we Americans are! We endlessly proclaim our devotion to democracy and human rights. We were once France's richest Western Hemisphere colony. It was the first country in the Americas after the United States to gain independence. But its history since independence has been pathetic — and never more pathetic than today, after 30 years of misrule by first, the demonic "Papa Doc," Francois Duvalier, and then his feeble, luxury-loving son, "Baby Doc," Jean-Claude Duvalier.

So we block a peace settlement in Central America because of our alleged commitment to the future of democracy in Nicaragua — a commitment not visible to the naked eye when the Somozas ruled Nicaragua and hardly visible today in policy toward, say, the Pinochet dictatorship in Chile. And we righteous denounce lapses from democratic purity in Angola, Mozambique and Yemen.

America's capacity for oppression and misery between Papal Doc's praetorian guard of official thugs, the notorious Ton-ton Macoutes, and his voodoo doctors, the Haitian people, already miserably poor, undernourished and demoralized, were reduced to almost hopeless passivity.

There was a small and gifted class of educated Haitians — economists, writers, painters — but they were mostly driven out or killed during the Duvalier years. Today the economy is in ruins. Per capita income is a good deal less than it was two centuries ago. Haiti is far and away the poorest country in the Western Hemisphere.

Finally Haitians could take the Duvaliers no longer. In February 1986, Baby Doc, who had optimistically

styled himself president-for-life, fled.

A provisional government was established. But, led by a Duvalierist general, it tried to protect survivors of the old regime and rapidly lost whatever moral authority it might have enjoyed.

Conditions have been steadily worsening. The country is sinking into chaos. The fabric of its society is disintegrating. In the meantime, so far as one can tell, the American government, media and people regard this developing tragedy with sublime indifference.

An administration in Washington that not long ago was apologetic to itself for having saved the 100,000 inhabitants of Grenada from unspecified terrors today ignores the smarthy threatening five million Haitians. U.S. policy is to keep sending a flood of military aid and a trickle of economic aid to an interim government that few Haitians like or trust.

President Reagan, so pious and vulnerable on Afghanistan's woes, is silent on Haiti. If only there were the threat of a communist takeover! But the Soviet Union has troubles of its own; one doubts it would accept Haiti as a gift.

Haiti was once one of the most prosperous islands in the Antilles. It

was once France's richest Western Hemisphere colony. It was the first country in the Americas after the United States to gain independence. But its history since independence has been pathetic — and never more pathetic than today, after 30 years of misrule by first, the demonic "Papa Doc," Francois Duvalier, and then his feeble, luxury-loving son, "Baby Doc," Jean-Claude Duvalier.

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The answer is not easy or obvious,

but that does not excuse reluctance to

confront the question. No one wants to

return to a United States military occu-

pation. But how about a multi-

national rescue mission undertaken

through the Organization of American

States or the United Nations?

The underlying reason for Israel's

new impotence in Washington, in my

view, is in information still being de-

veloped at the Justice Department.

The festering Jonathan Jay Pollard

spy case, and the refusal of Israel's

agging leaders to face up to the urgent

need to treat the source of infection.

make possible the defeat of Israeli eco-

nomic, anti-terrorist and strategic ar-

gments all through the U.S. government?

Pollard? Wasn't the American tra-

tor who was hired to provide a roomful

of secret documents to Israel con-

victed and jailed?

Wasn't the South Africa at all discuss-

ing the "Rebellion Leaves Mozam-

bique County" fails to men-

tion the South Africa using

the same tactic?

Hadn't the South African

and East Africa as supporters of Mozam-

bique County?

Randiall Erickson, Paris

Moscow administration has recent-

ly made clear that there is no connec-

tion between the U.S. and the

U.S. and the Soviet Union.



## Sikh Priests Say Militants Have Unified For Struggle

Compiled by Our Staff From Dispatches

AMRITSAR, India — Four of the five chief priests of the Sikh religion on Wednesday declared that militant groups fighting for a separate Sikh nation in Punjab State had unified, and the priests urged followers to support the "war of leadership."

The priests said that 16 militant groups in India and abroad had achieved "complete unity" and would provide political leadership to Sikhs in place of the "discarded Akali leadership."

The statement was the strongest yet by Sikh religious authorities.

It occurred as the separatist campaign is becoming increasingly violent after the government of Prime Minister Rajiv Gandhi took over the administration of the northern state on May 11. Mr. Gandhi dismissed the moderate Sikh government of the Akali Dal, the traditional Sikh political party.

The national government reacted sharply to the priests' statement and vowed to defeat Sikh terrorism.

The priests' statement "has come as an open and direct challenge to the unity and integrity of the Indian nation," Federal Home Minister Buta Singh said in New Delhi.

The announcement was made by four of the five members of the Akali Takht, the religion's highest temporal body. It is responsible for preserving the faith and arbitrating religious disputes.

The announcement from the Golden Temple, seat of the Sikhs, called on Sikhs worldwide to give "one man, one or body, soul and wealth, to the militants" decisive war for liberation." It said the Indian government was oppressing Sikhs throughout the country.

The militants claim Sikhs suffer discrimination from India's Hindus, who make up more than 80 percent of the country's more than 750 million people.

Sikhs, whose religion was founded as an alternative to warring Hindus and Islam, make up only 2 percent of India's population. But they are a majority in the Punjab, a rich farming state.

Jaswant Singh of the Damdama Sahib, a major Sikh temple, read Wednesday's announcement at a news conference.

Three other leading Sikh priests, Puran Singh, Kashmir Singh and Sawinder Singh, said they supported the statement. Singh, which means lion in Punjabi, is part of every Sikh man's name.

A formal announcement about the unification of the militants will be made by the groups soon, the priests said.

The 16 groups are known to include the Khalistan Commando Force, Khalistan Liberation Force, Babbar Khalsa and Bhindranwale Tiger Force.

The priests also criticized professor Darshan Singh, the head of the Akali Takht and fifth member of the body, for fleeing the Golden Temple on Aug. 8 after he received death threats from militants in the shrine.

On Aug. 17 the four priests had called on the militants to provide leadership for the 16-million-strong Sikh community in place of the Akali Dal.

The Akali Dal was elected to power in Punjab in 1985, but dismissed in May by New Delhi for allegedly failing to tackle the campaign for a homeland in Punjab, in which nearly 1,300 people have died since last year.

The Indian Army stormed the Golden Temple on June 6, 1984, and more than 1,000 people were killed, most of them Sikhs. The prime minister at that time, Indira Gandhi, ordered the raid to drive out Sikh militants using the temple as a refuge for attacking Hindus and rival Sikhs.

On Oct. 31, 1984, Mrs. Gandhi was assassinated in New Delhi, and police said the killers were two of her Sikh bodyguards who were avenging the Golden Temple raid. One Sikh guard was shot to death by other guards. Three other Sikhs were convicted in connection with his killing and have been sentenced to be executed.

(AP, AFP, UPI)



**EXTRADITED FANS IN BRUSSELS** — Police vans carrying 25 Liverpool football fans arriving Wednesday at the Palace of Justice in Brussels for a hearing before a magistrate on charges of manslaughter in connection with the Heysel Stadium riot, in which 39 persons were killed in 1985. A 26th fan who was scheduled to be extradited was still Britain in connection with another case, police said. The trial is expected late this year or early next.

## EXPORT: French Firm Investigated in Sale of Military Technology to Soviet

(Continued from Page 1)  
clear, and he added: "They are generally reluctant to talk."

COCOM's list of products that cannot be sold to Soviet bloc countries include milling machines with more than three independent axes, or cutting directions. The number of axes on a milling machine determine its ability to produce complex parts.

French government authorities were not available for comment and did not return telephone calls.

In a report issued to the press in Tokyo, Toshiba said its engineers had seen a multi-axis machine made by Rater-Forest already operating at the Baltic Shipyard near Leningrad when they arrived to install their own, more sophisticated, five-axis machines in 1983.

U.S. investigators believe Toshiba had initially turned down requests for the milling machines from the Soviet Union, citing COCOM restrictions. They said Toshiba only changed its mind after it learned its French competitor had already shipped similar machines.

Christian Sarret, an executive of Forest Line, as the French company now is known, said Wednesday that "to the best of our knowledge, all machines produced in our workshops and sold abroad have authorization from COCOM."

A former executive of Rater-Forest, who was involved in the sale, said he doubted the company broke any rules in selling the machines.

"I'm not sure these machines were ever in contradiction with COCOM," said Robert Vitrat, who at the time was sales director of Rater-Forest. He said the company delivered "at most" two of the five-axis machines to the Soviet Union in 1976-77.

He said the export license applications were approved by the industry and trade ministries, as well as France's COCOM delegation.

"As far as I remember, we had

no problem at all getting approval for that kind of machine," he said.

He added that the company was aware that the machines were going to be used at the shipyards, but that it did not know they would be used for military applications. The Soviets, he said, did not permit the company to install the machines.

One U.S. naval analyst, who asked not to be named, said: "I suspect that if they had a program to make a new generation of submarine propellers, the French equipment was a considerable help."

Mr. Vitrat acknowledged the machines may have helped "im-

prove the production and productivity" of the submarine propellers, but he emphasized that the Soviets had already designed and produced the parts on their own.

"No machine has invented a new propeller profile, and that's a very important point," he said.

U.S. officials say the machines' final destination should have kept the French authorities from approving such a sale.

"The disturbing thing here is that if anyone said 'Baltic Shipyard' to us we would have said 'No, never,'" said Stephen D. Bryen, who heads the Pentagon's export control office.

Later he attempted to back off any implication that he was advocating U.S. military action in Nicaragua. He said that he did not know whether Mr. Ortega's government could be overthrown in three days and that it would be preferable if other Central American nations "can isolate Nicaragua."

Asked how far he is willing to go in seeking a military solution in the region, he said: "I'm not even suggesting that. We don't need to do that."

Asked again Wednesday about the invasion comment, Mr. Dole declined to repeat it. But he added, "I just said some people would not find that too offensive."

## ■ Peace Plan Called Flawed

Jack F. Kemp, a conservative U.S. congressman, has opened a campaign to persuade Central America's leaders that the peace plan they signed last month is "fundamentally flawed" and a recipe for disaster" in the region. The New York Times reported from Tegucigalpa, Honduras.

Mr. Schlueter said that the three gainers in the election all had "extremist views."

## DANES: Schluter to Stay On Despite Election Setback

(Continued from Page 1)  
played surprising strength rallying blue-collar workers with its anti-tax, anti-immigrant message.

The Progress Party's nine votes would give Mr. Schluter his majority, but the Radical Left refused to form a coalition with a party it regarded as "racist."

Anker Jorgensen, 65, a former prime minister and the leader of the Social Democrats, moved boldly Wednesday to take advantage of Mr. Schluter's troubles. He asked

Niels Helvig Petersen, the Radical Left leader, to abandon Mr. Schluter and add his 11 votes to the 85 votes held by the coalition led by the Social Democrats and the Socialists People's Party.

This would bring in a new Socialist government and amount to a dramatic repudiation of Mr. Schluter's effort, since 1982, to move Denmark toward a market economy and restrain spending on maintenance of the welfare state.

Given the high political stakes, it is hard to think of another country where such bargaining among three leaders would take place at a good-humored public luncheon.

On Wednesday at the Hotel Royal in Copenhagen, the audience laughed and the three men exchanged witticisms as Mr. Jorgensen asked Mr. Petersen to help him do in Mr. Schluter. Mr. Petersen responded cordially, but refused.

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## MARSHALL: Supreme Court Justice Criticizes Reagan on Civil Rights

(Continued from Page 1)

dent in comments off the bench. In his interviews with Mr. Rowan, Justice Marshall also gave unflattering assessments of Presidents Franklin D. Roosevelt, Dwight D. Eisenhower and John F. Kennedy, while praising Presidents Harry S. Truman and Lyndon B. Johnson.

The interviews were recorded in recent months for a program on the Constitution called "Searching for Justice: Three American Stories."

In a telephone interview Tuesday evening, Justice Marshall said that as far as he recalled, his interview with Mr. Rowan was the only formal news interview he had given since President Johnson named him to the court in 1967.

In the telephone interview, the justice chattered at times as a reporter read back to him parts of the transcript, apparently amused by the interest his comments had aroused. But he said, "I'm not going to get into elaborate on anything."

He also declined to comment on the nomination of Judge Robert H. Bork to the Supreme Court. Judge Bork, who has a conservative judicial philosophy, has criticized many Supreme Court decisions in which Justice Marshall has joined.

In his interview with Mr. Rowan, Justice Marshall spoke bitterly of the treatment of blacks throughout American history, including the present. In a speech in May he denounced the "perpetuation of slavery" and other actions by the framers of the Constitution.

However, in the interview with Mr. Rowan, he said that with the addition of the post-Civil War amendments extending rights to blacks, "You'll never find a better Constitution than one."

"The biggest thing we bring about in this country on the ethical side is that it's the great melting pot," Justice Marshall said. "At 1 a.m. and look at it now at this late date, I have come to the definite conclusion that if the United States is indeed the greatest melting pot, the Negro either didn't get in the pot or he didn't get melted down."

Asked by Mr. Rowan to rate some of the presidents and their impact on racial justice in his lifetime, Justice Marshall said:

"I don't think Roosevelt did much for the Negro. But I think Truman is going to come out top. Eisenhower I don't think did anything except to try to understand."

Today, San Marino has official relations with more than 50 coun-

tries, including China and the Soviet Union.

In a world in which power and the supremacy of force determine the lives of people, the experience of the small countries is more important than ever, said Antonina Bonelli, director of San Marino's department of foreign relations.

"We have shown that even with less territory and no weapons, you can live happily."

As in the past, San Marino's survival depends on harmonious relations with Italy, which surrounds it.

In the 1950s, when the tiny republic elected a Communist government and opened a casino, Italy sent a squad of carabinieri to blockade its 31-kilometer-long frontier with San Marino. More recently, because of its open frontier with Italy, San Marino has had to take on some of the tax and other obligations of the European Community without getting many of the benefits of membership.

But the other mini-nations have to take someone bigger into account and get by on their wits.

Malta lives in uneasy proximity to the government of Colonel Moammar Gadhafi in Libya. Liechtenstein depends on Switzerland for its defense, foreign affairs, transportation and telecommunications. Andorra has historically kept its autonomy by playing France against Spain and by being unstrategically placed at the top of an inaccessible mountain range.

The principality of Monaco, with about 26,000 people packed into 1.81 square kilometers, enjoys independence under Prince Rainier III but tends to be regarded by France as an eccentric monarchy on the Côte d'Azur. San Marino, which has a resident population of fewer than 400 and which was not represented at the meeting, has a secure identity and a steady income as the center of world Catholicism.

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Once, much of Italy was divided into city-states like San Marino. Being poor, isolated and difficult to invade on top of their fortified mountain in the Apennines, the San Marinese managed to avoid the attention of invading armies by keeping order at home and staying out of other peoples' disputes.

Today, San Marino has official relations with more than 50 coun-

## Dole Says Call for 'a Little' Invasion Of Nicaragua Was Not Just a Quip

The Associated Press  
WASHINGTON — The Senate Republican leader, Bob Dole, said Wednesday that he was not simply making "a quip" when he was quoted as saying that "a little three-day invasion" of Nicaragua would be welcomed by the people of Central America.

The Kansas Republican said that "I was just expressing an opinion" that President Daniel Ortega Saavedra of Nicaragua was not well-liked in Central America.

"It wasn't a quip," Senator Dole said. "It was a very serious interview with Milwaukee Sentinel reporters."

The senator, an announced candidate for the Republican presidential nomination, visited Nicaragua during the monthlong congressional recess that ended Wednesday. During the visit he met Mr. Ortega.

In the interview, Senator Dole suggested that Mr. Ortega is so disliked by other Central American leaders that President Oscar Arias Sanchez of Costa Rica would not object if somebody came down there and sort of blew" Mr. Ortega

ing to relax our efforts to continue aid to the freedom fighters."

The congresswoman, along with Senator Jesse Helms, Republican of North Carolina, is the author of a bill to provide \$310 million in assistance to the contras over the next 18 months.

Under a peace plan signed by the leaders of Costa Rica, Guatemala, El Salvador, Honduras and Nicaragua last month, cease-fires are to begin in both Nicaragua and El Salvador on Nov. 7 and outside assistance to insurgents in Central America is to stop.

U.S. officials have expressed at least lukewarm support for the peace plan. They have said that they might seek additional aid for the contras if the plan, which includes pledges by Nicaragua to declare an amnesty and lift restrictions on dissent, were to falter.

For Mr. Kemp and other conservatives, the flaw in the plan is that while it calls on the United States to halt assistance to the rebels, it allows the Soviet Union and Cuba to continue to supply the Nicaraguan government.

## Land Reform Minister Dies in Brazil Air Crash

By Juan de Onis  
*International Herald Tribune*

RIO DE JANEIRO — Brazil's agrarian reform minister and six top advisers have been killed in a plane crash, dealing a severe blow to President José Sarney's program to give land to more than one million peasants.

An air force jet carrying the minister, Marcos Freire, and the advisers crashed Tuesday evening just after taking off from an airport at Carajás in the Amazonian state of Para. Witnesses said the plane exploded before the crash.

Mr. Freire, a moderate, was appointed three months ago to negotiate with the powerful landowner associations, which have armed themselves against peasant land invasions.

The Roman Catholic Church, which actively supports peasant demands for land, has reported the killing of more than 150 people in land disputes since 1985, including two priests and a nun.

Resistance from landowners, lack of funds and shoddy administration of the land distribution program have severely restricted Mr. Sarney's ambitious target of getting 1.4 million peasants in five years.

Mr. Freire said last week that only 17,000 peasant families had been settled under the program last year.



**GULF: Iraq Reports 13 Bombing Attacks Against Iran**

(Continued from Page 1)  
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little' Invasion  
Just a Quip

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## form Minister Brazil Air Crash

national figure of the  
Brazilian Democratic Movement.  
Mr. Freire, a moderate who  
Sarney's fourth minister in  
reform in less than three years.  
His predecessors all resigned  
fire from landowners.

He was appointed three weeks  
ago to negotiate with the  
landowners' association, which  
have armed themselves  
against land invasion.

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**leagan on Civil Rights**

Justice Marshall "like  
it right" that the average  
black man can do  
more than what he does.

Justice Marshall, 80, told  
Kanter that after he was acquisitions and knowhow sales are proliferating in the carbon business — but that is  
Hewlett-Packard's problem because carbon is becoming high-tech.

He said he had to give up  
the market he previously gave  
Mr. Nease to because it  
was a court order to do so.

**Next Issue**

New technologies are aiding archaeologists in  
unlocking the mysteries of the pharaohs. Car-  
makers are finding the team approach to automated  
manufacturing isn't always the solution. These and other issues on Dec. 15, in  
TechnologyQuarterly.

## DEPARTMENTS

### At Home

8

One of the only sure bets at the Frankfurt Auto Show opening Friday is the world debut of the BMW Z1 roadster. They have said they might seek additional conditions if the plan includes pledges by Nicaragua to clarify an amnesty and to allow dissent, were to be included.

For Mr. Kemp and other representatives, the flaw in the plan is that it calls on the United States to halt assistance to the Contras and the Soviet Union and to continue to supply the Soviet government.

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are press-  
ured in  
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Business

9

Safer flying is one of the aims of a technologically advanced device for airplane cockpits called head-up display. The device in test has enabled pilots to land manually in conditions that would have closed an airport.

### Computers

10

Western nations are easing rules on computer exports to the Soviet Union, but one long-time critic argues that doing so could be fulfilling Lenin's dictum that capitalists will produce the rope needed to hang themselves.

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which actively supports  
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only 17,000 peasant families  
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year.

**Workplace**

11

Clocking in on Platform 6 at 7:40 A.M., office staff of Asca, Scandinavia's largest maker of heavy electrical equipment, take to their desks in the world's first railborne mobile office.

**Research**

12

Although scientists continue to debate exactly  
why and how it works, the process of applying  
electricity to aid in the repair and growth of  
bones soon may be extended to an array of  
other problems, ranging from osteoporosis  
and osteoarthritis to spinal fusions and skin  
ulcers.

**Developments**

13

Takeover bids, joint ventures, international  
partnerships and new acquisitions and know-how sales are proliferating in the carbon business — but that is  
Hewlett-Packard's problem because carbon is becoming high-tech.

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the market he previously gave  
Mr. Nease to because it  
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**Map Makes Small**

the community decide  
that their American  
would be used.

Like many others,  
found the decision  
too much of a headache  
in preventing natural  
gas from entering the  
United States.

Mr. Nease, 56, who  
had been working on  
the project for 10 years,  
said he had to give up  
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was a court order to do so.

**This computer needs no keyboard for communication.  
It understands plain English.**

INTERNATIONAL  
Herald Tribune.

Issue No. 2

# Technology Quarterly

## Nations Divided on Ozone Accord

By Thomas Netter

**G**ENEVA — In a last-minute hitch that could derail an historic agreement to save the Earth's vital ozone layer, the United States — and several other industrialized countries — have added potentially divisive proposals to the agenda of an international ozone conference in Montreal, environmentalists said Wednesday.

A new U.S. proposal, said to come from the White House and backed by anti-regulatory elements in the U.S. departments of Commerce and the Interior, would require 90 percent of the world's manufacturers of ozone-destroying chlorofluorocarbons, or CFCs, to ratify an agreement before it comes into force, according to David D. Doniger, an attorney at the Natural Resources Defense Council in Washington.

This measure, which Mr. Doniger said has the support of the Soviet Union, would allow Moscow and almost any other country to effectively veto an agreement because the Soviet Union produces 10 percent of world CFC production.

But the new U.S. proposal, raised during preliminary meetings in Montreal this week, is only one of several proposals that could make next week's meeting difficult, Mr. Doniger said. The European Community has proposed eliminating an important category of CFCs from the accord and limiting all 12 member state's production together, so a production

decrease by one could allow an increase by another, Mr. Doniger said.

At issue is whether the ozone layer can be protected by an international treaty or whether alternative means, such as individual measures involving sunglasses and hats as proposed by some anti-regulatory U.S. officials, should be used.

Ozone is a special form of oxygen that reaches high concentrations in the stratosphere 10 to 30 miles (16 to 48 kilometers) above the Earth. This protective layer permits life on Earth by filtering the sun's harmful ultraviolet rays. If unimpeded, these rays can cause skin cancer, eye problems and reduced crop yields. In the early 1970s, scientists found that certain chlorine-based chemicals were gobbling up the ozone layer at an alarming rate.

These chlorofluorocarbons stay intact until they disintegrate, their fragments destroying ozone. The gases are also believed to contribute to the warming of the atmosphere, the so-called greenhouse effect that results

when gases prevent radiant heat from escaping the Earth's atmosphere.

CFCs provide the spray in many aerosol spray cans, the cooling agents for refrigerators and air conditioners, the cleaning agents for computers, and the foam in foam rubber.

In 1978, the United States and Canada banned the use of CFCs in aerosol spray cans, causing a temporary decline in emissions. Most European countries, however, acted only to prohibit the construction of new plants producing this chemical. The chemical is still widely used for other applications. Per year, industry produces about 600,000 metric tons of CFCs.

The discovery of a growing "hole" in the ozone layer over Antarctica and parts of Switzerland that scientists suspect is caused by CFC emissions, has given new urgency to the issue.

In the most thorough study to date, a team of 150 experts organized by the National Aeronautics and Space Administration is conducting flights in the area this month to determine whether the "hole" is being caused by industrial pollution. The hole over the Antarctic appears each year in mid-September at the end of the southern winter. The amount of ozone decreases to less than half its normal density before returning to normal levels in October.

Other scientists are studying the Arctic skies, where a transitory thinning of the ozone layer was detected in February and March last year.

The meeting in Montreal, which is organized by the United Nations Environmental Program, is seeking to put the finishing touches on a tentative agreement

Continued on page 13



Over South Pole, a hole in stratospheric ozone has expanded to cover an area as large as the United States. Ozone protects the Earth from harmful ultraviolet rays.

## Ytterbium? Or How a Typo Set Off Scientific Scramble



Ching-Wu Chu in his superconductor lab at the University of Houston.

By James Gleick

**C**ERTAIN American scientists wasted some time recently trying to make a superconductor out of the wrong element. They were chasing a phantom — a typographical error by the physicist, Ching-Wu Chu. Certain American scientists believe that the error was no accident.

Mr. Chu, 36, stunned his colleagues and competitors in laboratories around the world last February by announcing the discovery of a new material that would make the phenomenon of superconductivity commercially feasible at last. But he refused to name the material before the official publication of his discovery, which was weeks away.

His claim set off a stampede. For experimenters struggling to take part, a hellish month followed — a month of tense days and sleepless nights. A practical superconductor, a material through which electricity flows without losing even the smallest fraction of its energy to resistance, would be a turning point in scientific history. Scientists were glimpsing a new age of electricity — a world of absurdly cheap power and trains floating in the grips of magnets. Enormous corporate interests were already at stake. Patent lawyers were chaperoning

JAMES GLEICK, a science reporter for The New York Times, is the author of "Chaos: Making a New Science," to be published by Viking in October.

the research teams like pilot fish surrounding sharks.

So Mr. Chu's incomplete announcement was every scientist's nightmare: the breakthrough of a generation, and someone else had the secret formula.

"It was gruesome," said Robert J. Cava, a member of a team at the American Telephone & Telegraph Co.'s Bell Laboratories, one of the major institutions near the forefront of the research. "There was a lot of pressure on us to figure out what was going on."

The Bell researchers say they remained in the dark until the last days before publication, but other scientists heard a provocative rumor: that the esoteric element ytterbium was the key to the new superconductive material.

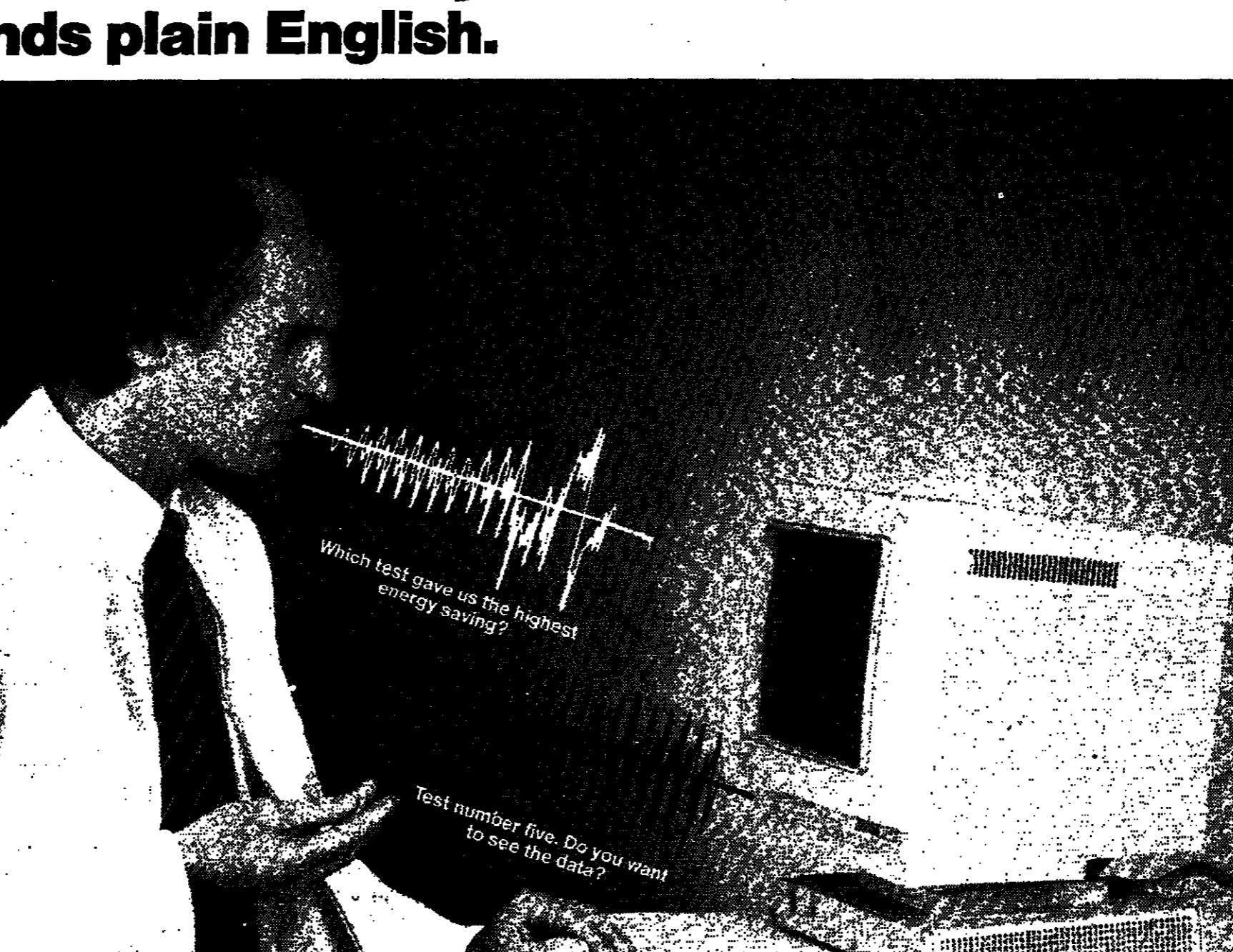
Ytterbium was indeed the element named in the manuscript that had been submitted by Mr. Chu's team, relative unknowns at the University of Houston, to Physical Review Letters, the premier journal for reporting breakthroughs in physics. But when the journal appeared on March 2, the final paper named a different element, yttrium.

Mr. Chu had pleaded with the journal for special handling, insisting on secrecy, fearful that the editors would leak. "Which we now know they did — like a sieve," said Arthur J. Freeman, a theoretical physicist at Northwestern University. "Only they leaked ytterbium instead of yttrium. I had heard for weeks that the material was ytterbium, and now I know where it came from."

As news of the yttrium-ytterbium affair

Continued on page 12

## This computer needs no keyboard for communication. It understands plain English.



AEG is developing an automatic speech recognition system by which computers of future generations will correctly react and answer to spoken instructions. This dialogue with computers is becoming more human.

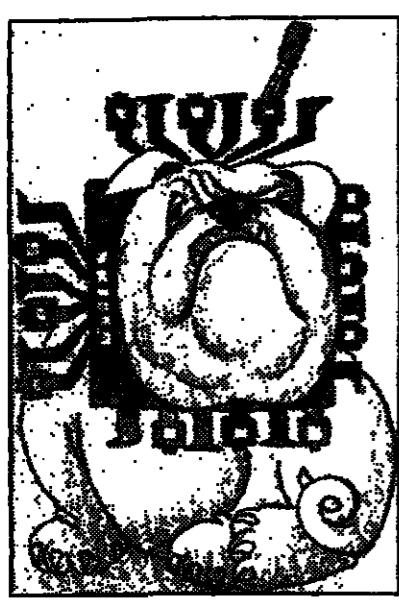
**285** AEG uses the "Chip on Glass" technique for LCD type displays. Advantages: the display and driver electronic system are combined into a single unit, so the number of contact points is reduced to a minimum. This leaves the display back clear, allowing optimal rear illumination. Result: high brilliance at any time of day.

AEG supplies efficient electronic systems for environmental protection purposes: contaminants contained in both air and water can be automatically identified and analyzed, and there can be exact control of processes in waste incineration, exhaust gas purification or water treatment. In the event of operating trouble these "intelligent" microcomputers automatically contact the central system via the phone.

AEG's grouped networking is contributing to the economic use of the radio bands. Radio channels are bundled and managed by a computer, then allocated to subscribers as required. Communication bottlenecks are a thing of the past. This technology offers a number of characteristics not found in the usual radio networks. Grouped networking from AEG — already in successful operation in Schiphol airport Amsterdam and under construction in Frankfurt.

**AEG**

## Technology At Home



Sophie Pierre

## Sensory Assault

**W**HAT'S next for the modern flea? A electronic collar that will break the eardrums of any pest coming within a few feet.

Elexis Corp. of Miami has developed just such a device — an electronic collar for dogs and cats that emits a high-frequency sound that disrupts the sensory system of fleas and ticks.

The collar, called Microtech, employs a technology known as pulse-modulated burst circuit that creates a high-intensity sound beyond the audible range of dogs and cats but deafening to fleas.

"To a flea, it sounds like a jackhammer and that makes them run for cover," said Dr. Robert W. Stone, chief of staff at Knowles Animal Hospital in Miami.

Dr. Stone said that in hospital tests the electronic collar proved to be 60 to 90 percent effective in reducing the number of fleas on pets. (NYT)

## Contact Lenses To Throw Away

**V**ISTAKON Inc., a Florida-based subsidiary of Johnson & Johnson, has begun market testing of disposable contact lenses.

The lenses, which are 52 percent water and made of standard contact-lens plastic, require no cleaning and can be worn for about a week before being discarded.

The company estimates that using the disposable lenses would cost an average \$520 a year. The lenses are being sold in Florida in a six-pack and are available for nearsighted correction only.

The U.S. Food and Drug Administration approved the lenses as disposable products in July. They had previously been approved for extended wear. (AP)

# Frankfurt Auto Show to Offer Some Souped-Up Surprises

By Michael Rutherford

**L**ONDON — Major European motor shows are unpredictable events renowned for their last-minute unveilings and surprise announcements.

Take, for example, the Geneva show last March: Aston Martin revealed its new, razor-sharp Lagonda to a stunned press and public; a Bentley Turbo R, built by British coachbuilder Hooper was unveiled and immediately hailed as the "most expensive car ever to be produced for private sale." And Chrysler caught everyone with their guard down by announcing the brave (some might say foolish) decision to re-enter the fiercely competitive European market, where the Chrysler image is, at best, tarnished.

If the comparatively tame and unexciting Geneva show was capable of springing those kinds of surprises and more, it is anyone's guess what might happen at the 1987 Frankfurt show, which opens on Sept. 11. Frankfurt, probably the event in the European motor show calendar, is likely to be full of surprises.

Not many people can safely predict exactly what will go on show. In fact, one of the only things that is 100 percent certain to happen at Frankfurt is the world debut of the BMW Z1 roadster. The company is reportedly fed up with scoop photographs, assumptions, claims and doubts surrounding the car and has, therefore, decided to "put an end to supposition and rumor" by displaying the car on home soil.

The Z1, officially described as a "limited edition, mid-engined sports car," will go into production and on sale next summer. It is the brainchild of a small, young BMW offshoot, BMW Technik GmbH, which was set up by BMW AG as an autonomous operation with the objective of developing forward-looking products and processes.

The bold claim from Bavaria is that the Z1 is "light years ahead of the average souped-up mass-production car." It is based on a monocoque-style load-bearing skeletal steel chassis to which thermoplastic panels are hung. The plastic outer skin and bumpers/fenders help to keep the weight of the car down, and resistance to minor damage is assured. BMW says.

Although the two-seater Z1 can, according to the manufacturer, be driven in open-top form with scarcely any turbulence to disturb the occupants, there is an easy-to-use, leak-free soft top.

Beneath the skin, the Z1 boasts a variety of features lifted from current, highly successful BMW saloons. Initially, it will be powered by the new BMW 325i's six-cylinder engine. The low-pollution version with catalytic converter has "of course" been chosen, says BMW, which claims that the power pack accelerates the car from rest to 62 miles per hour in seven seconds.

Although BMW calls its new offering a mid-

engined car, the straight six engine sits just behind the front axle, which gives a near 50/50 weight distribution. Power reaches the rear wheels by way of a five-speed manual gearbox and a prop shaft running in a rigid aluminum tube to the rear differential, which is also made from aluminum.

The suspension uses BMW 3-series front spring damper struts and, at the rear, a Z arm layout of entirely new design. Handling is said to have a hint of go-kart immediacy about it.

With its wide track, low center of gravity and 49/51 rear axle load distribution, the Z1 has "more than adequate top speed," and everything needed for safe, predictable road behavior and abundant driving pleasure, says BMW.

The price of the Z1 is likely to be about £25,000 (\$40,000) when it goes on sale next summer. At that price, the car will be a certain sellout, particularly as only six a day will be produced.

Launched to the world's press a couple of months ago, the Ferrari F40 (working title, Ferrari Le Mans) seems certain to take the stage at Frankfurt and might just steal the show from the BMW Z1.

The public will see the F40 for the first time at Frankfurt, and what they will see is the fastest road-going car available from a manufacturer of production cars. Admittedly, that claim has been made by Ferrari itself — but few would argue. The F40's official maximum speed is a cool 201 mph, and acceleration from rest to 124 miles per hour takes a mere 12 seconds.

Never before has so much overt racing technology been applied to a road car. The F40 (F

or Ferrari, 40 because it celebrates 40 years of "super-car" production) has a stark interior, tubular steel chassis with carbon fiber reinforcement, and also features Kevlar, a stronger-than-steel fiberglass material more commonly used on Formula 1 racing cars.

Rubber bag fuel tanks are also part of the F40 package, along with an automatic lowering suspension system.

Beneath the car's louvered rear window, the longitudinally mounted V8 is clearly visible. It has twin turbochargers that help to produce a massive 478 bhp at 7000 rpm.

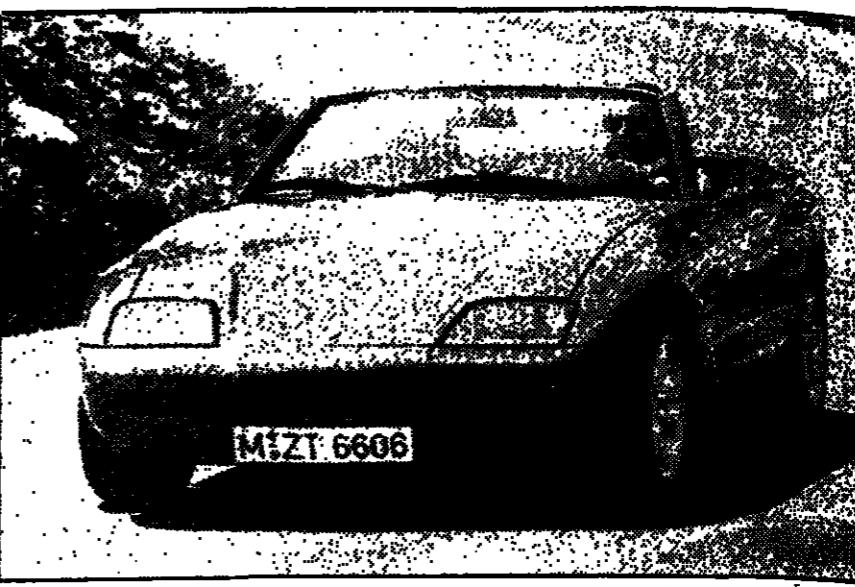
Only 450 F40s will be built, with deliveries being made starting in the spring. The V8 engine has the ability to meet U.S. emission requirements.

The basic price of the car in Italy is 270 million lire (\$201,000), plus car tax and value added tax. For that money, buyers will be invited to select a driving seat that matches their particular body shapes. And they will also go through a two-day "familiarization session" with their cars.

As if to prove that state-of-the-art technology is not the sole property of the dreamcar manufacturers like BMW and Ferrari, Ford will be tempting Frankfurt visitors with its own brand of more affordable high-tech wizardry.

The company's latest showpiece, designed and built jointly by the U.S. Light Truck division in Dearborn, Michigan, and the Ghia design studio in Turin, is the HFX Ghia Aerostar — a so-called "family driving machine" for the next century.

Ford is serious about the HFX project, so



BMW's "limited edition" monocoque-style sports car, the Z1.

much so that \$7.2 million and 27 months have already been invested in it.

The HFX is a six-seater, van-like vehicle powered by a three-liter V6 engine driving through a four-speed automatic transmission to the rear wheels. The suspension has a conventional layout, but uses air-springing from the Lincoln Continental and liquid-filled bushes for insulation of vibration.

The HFX's all-disc braking setup incorporates Bendix anti-lock and anti-spin devices, while the rack and pinion steering has speed variable assistance provided by an electric motor.

The Ghia-built steel body (which retains the basic shape of the standard Aerostar) has flush glazing and sensor-controlled radiator louvers.

As might be expected, interior gadgetry is

extensive. There is a dot matrix instrument pack with a choice of three gauge styles and a touch-sensitive screen for controlling air conditioning and trip computer functions. At the touch of a switch, rear windows can be "fogged" for privacy. A laminate using liquid crystal technology is responsible for the fogging process, which, sensibly, cannot be used on the windshield or front-door glass.

No less than 26 computers on board the Aerostar HFX are capable of adjusting/motorizing seat settings, seat belt movements and even pedal settings.

Among other manufacturers, Alfa Romeo will finally put on display the much talked about 164; Audi Volkswagen is bound to pull the wraps off something (the new Scirocco or Audi 90 Coupe perhaps); and Jaguar, keen to establish a stronger foothold in West Germany, may also surprise everyone by showing something for the first time. The fully convertible XJS has already been spotted undergoing "secret" testing in Britain.

Mercedes and Porsche are also expected to reveal new and exciting models on home ground. The new Mercedes SL sports car, for example, should make its debut at the show although nobody within the industry is putting money on it. A safe bet is that Opel will show the nippy Corsa GS, which is about to challenge current offerings in the competitive hatchback sector.

Rivalry will be intense among Japanese manufacturers at Frankfurt. Honda and Mazda are racing each other to be the first to introduce four-wheel steering on cars in European showrooms. The latter has also just released a convertible RX7 in Japan, which means a European debut for the car is due. Toyota, which is rumored to be looking seriously at establishing a European production plant similar to the Nissan factory in the northeast of England, may be introducing several important new variants at Frankfurt. The new Corolla range is the most significant.

MICHAEL RUTHERFORD is news editor of Motor, the London weekly magazine.

## Final Score at Buick: Buttons 1, High Tech 0

By John Holusha

**H**Igh TECH is not the answer to every problem, officials of the Buick division of General Motors have learned. When a new and distinctly smaller Riviera model was introduced in late 1985, Buick decided to compensate for the lost bulk with gee-whiz electronics.

In place of familiar controls for the radio, heater, fan and air conditioner, the car's instrument panel was dominated by a touch-sensitive cathode-ray tube. Drivers would touch one section of the screen to call up command displays, then tap other spots to change the station, lower the temperature or check gauges.

But drivers found the screens confusing and difficult to operate. And they had to take their eyes off the road to tap just the right spots on the screen in just the right sequence. "The Riviera's setup does nothing that a conventional array of knobs, buttons

and analog instruments could not do in a fraction of the time one spends fiddling with this microcircuited mess," Car and Driver magazine observed in a review.

All the interior functions were controlled by the screen, so replacing it would have been expensive. And providing an electronics officer, as the air force often does, didn't seem very practical.

So Buick replaced the areas of the screen that control different functions with raised

buttons that could be operated by feel. Within the screen, it made the touch-sensitive areas larger — easier to hit. But it also added screens to control a tape player, cellular telephone and an appointment calendar.

"There may be no good way to do it, with all there is on the car," one Buick engineer commented.

Tom Shook/NYT

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## NOTEBOOK

## New TV Tube

THE IDEA OF A PERFECTLY flat-surfaced television set, and certainly received as heretical when first proposed, was originally developed in the 1970s when engineers at Philips had returned from a design seminar in Cambridge, England, with a new color monitor for computer games. The flat technology, however, which went on to become the most popular type of CRT monitor, did not appear until the early 1980s, and reduced its color television set market share.

Philips' color television set market share.

Source: Philips, Cambridge, England.

... Workers checking a flat techn...

## Passing Taste To

EDGES AT A LOS ANGELES County Fair re...

and a white wine entered the competition.

that the wine blend is...

wine tasting, we...

Most de...

distillation drive off the heat, but th...

a cold filter called rever...

developed by...

Inverse osmosis, also known as ultrafiltration...

along a porous cylindrical membrane. Because...

are the smallest molecules, they pass through...

leaving a syrupy wine concentrate be...

to the point where I'm filtering molecules...

at the atomic level," said Barry Gruenow, Ar...

to add water back, sometimes with a...

fermented juice, to create Ariet's monochro...

and sandwiches two membranes — one a den...

reversibility and a high-pressure flow. Th...

less intrusive than many used in modern...

all vinyl. Ariet's president, "The wine is...

alcohol," he said.

## Fiber Optics

GENEVA. A NEW fiber optic television and sound system being installed throughout the city to carry broadcast programs and computer...

four years.

Using fiber optic and coaxial cables, a firm cal...

NEVE SA, and formed by private inves...

with up to 30 local and foreign radio pro...

and television networks.

Geneva's television network is also expected to link...

Geneva, which has the highest dens...

users in Europe because of its well-develop...

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## Technology Business

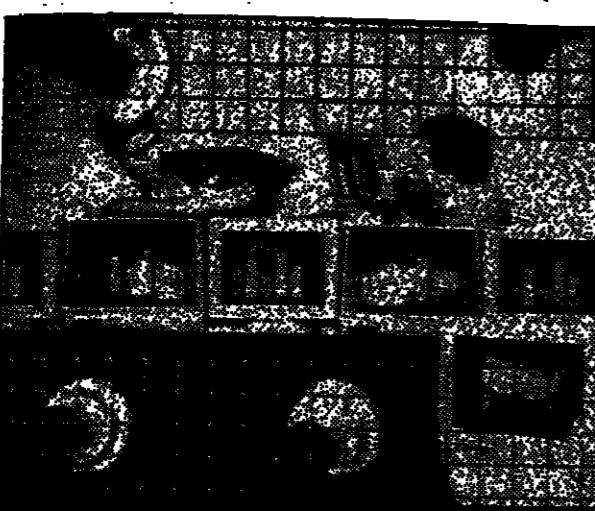
## NOTEBOOK

## New TV Tube

THE IDEA OF A PERFECTLY flat-surfaced color picture tube was tested, and reluctantly rejected as being far too complex, in the 1950s when color television was young. Now, using an advanced design that was originally developed for use in military avionics, Zenith Electronics Corp. has returned to "flat technology" with a new color monitor for computers.

The flat technology monitor, which went on sale in the United States last month, appears to offer significant advantages over conventional cathode ray tube (CRT) monitors in brightness, color fidelity and reduced glare.

The flat technology will also be incorporated into some of Zenith's color television sets next year, a spokesman for the Glenview, Illinois, company said. (NYT)



Zenith Workers checking a flat technology monitor.

## Passing Taste Test

JUDGES AT A LOS ANGELES County Fair recently awarded the gold medal to a white wine entered by Ariel Vineyards of San Jose. What they did not know until later was that the wine, Ariel Blanc, a blend of chardonnay and riesling, was a de-alcoholized wine.

Kudos will be given to wine manufacturers if they can find a de-alcoholized wine that is better than the original wine. The problem is that most de-alcoholized wines are not as good as the original wine. That is why Ariel is trying to develop a de-alcoholized wine that is as good as the original wine. (NYT)

Most de-alcoholized wines have been made with distillation methods that drive off the alcohol with heat, but the heat also evaporates flavors and aromas. Ariel instead uses a cold filtration process called reverse osmosis, a technology originally developed for desalination.

"It's to the point where I'm filtering molecules just above the atomic level," said Barry Gneekow, Ariel's wine maker, who then adds the water back, sometimes with a small amount of unfermented juice, to create Ariel's nonalcoholic wines.

Ariel sandwiches two membranes — one a dense but thin film polymer and the other thicker and more porous to permit greater retentiveness and a high-pressure flow. The result is a process less intrusive than many used in modern wine making.

And Larry Leigson, Ariel's president, "The wine is the flavor, not the alcohol," he said. (NYT)

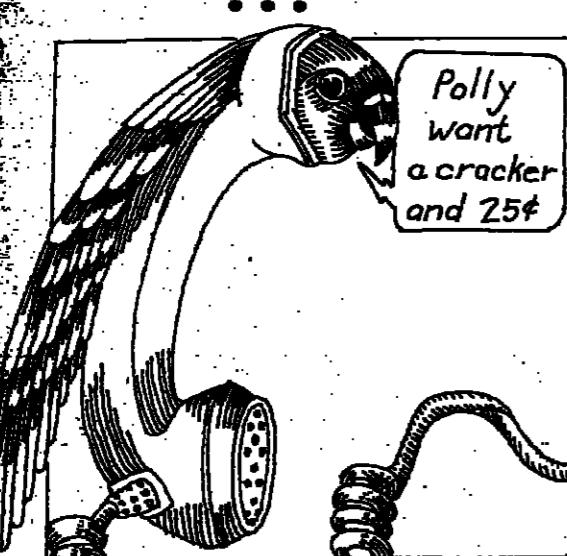
## Fiber Optics

IN GENEVA, A NEW fiber optic television and radio network now being installed throughout the city is to open up a large variety of broadcast programs and computer links over the next four years.

Using fiber optic and coaxial cables, a firm called 022-TELEGENEVE SA, and formed by private investors and the city, is connecting Geneva with a net of cables that will provide viewers with up to 30 local and foreign radio programs including Armed Forces Network and the Voice of America. It will eventually also provide up to 40 television channels, including Cable News Network from the United States and something called Gorizion from the Soviet Union.

"Telenet" won't cost much, officials say. Viewers accustomed to one channel of French-language Swiss television and sometimes blurry transmissions of the three main channels of French television may find it a real bargain.

The fiber optic network is also expected to link up computers in Geneva, which has the highest density of high-tech computers in Europe because of its well-developed service, banking and business interests. Thomas Nettler



## Talking Phones

INDEPENDENT PAY PHONE operators in the United States are turning to new technology to compete with the established Bell operating companies. Already available on a limited basis are pay phones ready to give callers verbal instructions, present advertising messages and operate with computerlike video displays. Others accept credit cards, operate in taxis and limousines and let users choose among competing long-distance services. Pay phones are also being deployed on trains, jet aircraft and ships.

For people too busy to wait, the best yet is Message Phone Inc., which will continue to dial a busy telephone number long after the caller has left the pay phone. The phone records a message from the caller and then redials the number for up to two hours until a connection is established and the recorded message is played. (NYT)

## Futuristic Cockpit Device Enhances Safety in Air

By Mark Patkay

**W**ASHINGTON — Changes in aircraft cockpit design are slow in coming. Only within the last four years, for example, has electronic flight instrumentation come into its own on the aircrew flight deck.

So, despite decades of space age promise, commercial aircraft are finally achieving a level of instrument sophistication that Apple Computer Corporation has been showing grade school students since the late 1970s.

NASA designers and engineers say the cockpit of the future will take far greater advantage of current computer graphics capability, creating full color, visual images rather than pure digital instrument indications in vogue today.

Using compact, airborne radar and infrared sensors plus data up-linked from the surface, pilots will see actual representations of land masses, hills and valleys. They will see runways in proper relationship and other nearby aircraft with far greater precision than the unaided human eye. And the computerized flight deck will display equally well in visual or instrument conditions.

Although this future may be sometime off, a device called HUD, for head-up display,

display, is here today. HUD offers a new dimension in aircraft instrumentation and a level of sophistication that promises a major enhancement in air safety.

The device allows pilots to continually look outside their cockpit while seeing instrument indications superimposed on the exterior view. In the current high density air traffic environment, the opportunity to continuously scan outside, dramatically decreases the chances for midair collision.

In light of the recent increase in reported airline near-collisions, HUD takes on particular significance. High density airport traffic operations demand close attention to the outside environment. This is exactly the time when a pilot must maintain continual reference to instruments inside the cockpit. HUD offers a solution by presenting instrument indications against a clear external view.

In addition, the device offers facility for making low visibility approaches from the surface, pilots will see actual representations of land masses, hills and valleys. They will see runways in proper relationship and other nearby aircraft with far greater precision than the unaided human eye. And the computerized flight deck will display equally well in visual or instrument conditions.

Currently two U.S. companies are developing and manufacturing commercial head-up displays. In 1985, Oregon-based Flight Dynamics Inc. received full Federal Aviation Administration approval and certification for HUD on the Boeing 727. Last month in conjunction with laser gyro, inertial navigation systems, a standard long-range navigation aid already aboard many domestic and trans-oceanic aircraft, the system was certified to assess an aircraft's encounter with windshear

and provide guidance for flying through it.

Jet Electronics and Technology, in Grand Rapids, Michigan, is also manufacturing a similar though slightly less sophisticated system for corporate aircraft.

Essentially, HUD is a small glass window that sits on top of the pilot's glare shield. A series of instrument symbols are projected onto the glass with a virtual image focused at infinity. This allows the pilot to see the outside view plus instrument indications superimposed, without shifting his focus.

On most conventional instrument approaches, the pilot is looking at his instruments. As he descends to the published minimum safe altitude, possibly 100 feet (30.4 meters) above the ground, he must look up and search for visual clues.

A normal human being takes four to five seconds to refocus and mentally assimilate the new image. In this case, the aircraft will be 50 feet lower before the pilot has responded, therefore, reducing safety margins considerably. HUD eliminates this lapse by maintaining the pilot's view and focus at outside infinity for the entire approach.

Windshear enhancement is also part of the order for Alaska Airlines and Federal Express from Flight Dynamics. Not only is the pilot warned that windshear condi-

tions are impending but flight guidance information is provided for a safe recovery when the full windshear is detected.

But despite its full availability, HUD has been slow to take off. Currently, Federal Express is installing six systems to allow its overnight package service to fly more regularly into often fog-bound West Coast airports. Alaska Airlines, with similar requirements, has recently purchased eight systems with 12 more on order.

The "bottom line" in airline operation is generally the deciding factor where safety enhancements are concerned. The Flight Dynamics system could cost between \$170,000 to \$300,000, depending on the retrofit problems. JET's device for corporate aviation sells for about \$100,000, without any consideration for the replumbing.

It is, therefore, unfortunate to learn that safety has a price tag, particularly when the promise of tomorrow is already on the suppliers' shelves. As the two airlines prove the value of HUD, hopefully other operators will follow.

**MARK PATKAY**, who writes on aviation, is the author of "Investors' Guide to the Strategic Defense Initiative," to be published next month by KCI Communications in Arlington, Virginia.



Head-up display, or HUD, helps pilots to avoid collisions.

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## Technology Computers

# PCs Are Still Waiting At Executives' Door

By Sherry Buchanan

**L**ONDON — The personal computer has yet to make it into every executive suite. The delay stems from the feeling among some status-conscious managers that typing isn't macho enough. Others are plain scared of new technology and will not bother learning how to use a personal computer, especially since their secretary can do it for them.

Although there are enthusiasts among executive personal computer users, most are finding they might have been better off getting one for their secretary rather than for themselves. The 1987 June survey by Intelligence Electronics Europe, a Paris-based market research firm, shows that, although it is on the increase, only a minority of white-collar workers in Europe use a personal computer at work. The same is true of the United States, where an estimated 18 percent of the white-collar work force used computers in 1986. Intelligence Electronics' figures for Europe include secretaries, clerks and managers.

On average, in 10 European countries, 8.3 percent of white-collar workers used personal computers in 1986; 9.8 percent in Switzerland, 9.6 percent in Britain, 8.6 percent in France and 7.8 percent in West Germany.

Those executives who do use computers have found them to be a mixed blessing. According to the 1987 survey, "Personal Computing: Executive Productivity Survey," conducted by Business Computing & Communications, a London publication, 75 percent of managers surveyed said using a personal computer improved their productivity and 50 percent said they believed the personal computer helped them make better decisions. But more than 50 percent said that having a personal computer meant they had to do work their secretaries used to do and 36 percent were not sure it helped in decision-making.

"Most managers said that the use of the personal computer improved their productivity," said Ian Meiklejohn, associate editor of Business Computing & Communications. "But it wasn't all positive. For many, it meant taking on additional activities that were mainly secretarial or clerical. Some didn't mind, but others didn't welcome the change."

As one British management consultant put it: "I have had no secretarial support for over two years. I may yet weave my own papyrus and grind my own ink."

Part of the reason for few executives using personal computers is that it does not help them do their job. Previous research, by Booz Allen, has shown that executives spend most of their time in meetings and on the phone, not glued to computers. In the British survey, 64 percent of managers surveyed said they only used their machine five to eight hours a week. The only people that made greater use of their computers were data-processing and information-systems staff.

"Regardless of how industry is presenting the product, executives are not going for it," said Gene Buffham, market researcher at International Resource Development Inc., a market research firm in Norwalk, Connecticut. The computer industry, to entice executives, have over the years introduced products to replace the keyboard, including the "mouse" pointer, the touch-sensitive screen and voice recognition, which computer analysts believe will take another 20 years to develop. Today, computers only understand a limited amount of vocabulary and will only respond to a trained voice.

"Executives spend the majority of their time talking to people, in meetings or on the telephone. They are not the ones doing the data inputting, that is reserved for lower level people," added Mrs. Buffham of International Resource Development.

Some British experts believe that many general managers are simply afraid of new technology. These managers may not like to operate personal computers themselves because they do not want to show colleagues that they do not understand them.

"These managers exhibit all the weaknesses and problems people do when they become fearful of their position," said Bert Darnell, the retired chief engineer of British Steel and an ardent advocate of the need to allay people's fears about new technology. "They become defensive and antipathetic to new ideas."

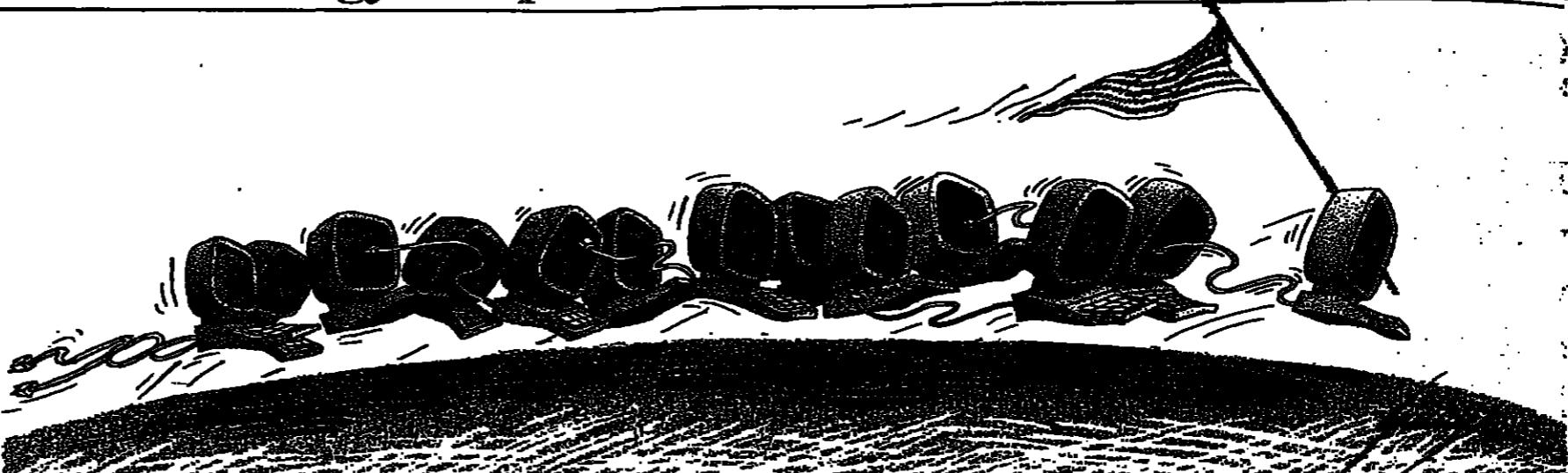
**B**UT WHAT about the following generations of top executives, some of whom will have started playing with computers in the romper room? As long as typing is associated with lower status, the personal computer will only make it from the playpen to the executive suite if it solves specific problems faced by top executives.

"Tomorrow's top exec will be more familiar with computers; whether that will carry over into the executive suite remains to be seen," Mrs. Buffham said.

In the Business Computing & Communications study, executives found personal computers to be essential for word processing (47 percent), accessing internal corporate databases (45 percent) and financial budgeting and planning (43 percent). For other management jobs, they did not find personal computers useful.

"The higher executives go, the less they are interested in using the personal computer themselves," said Michael MacCoby, a psychoanalyst and anthropologist, who is director of public policy and human development at the Kennedy School of Government at Harvard University. "The only reason people use technology is when it is more convenient."

**S**HERRY BUCHANAN writes the International Manager column for the International Herald Tribune.



## Soviets Set to Access the West

By Barry James

**P**ARIS — Bowing to what seems like the inevitable, Western nations are in the process of relaxing their ban on personal computer exports to the Soviet Union.

With the machines freely on sale at thousands of stores in the West, and available in bulk on many alternative markets, the embargo has increasingly been seen by manufacturers as an anachronism that hurts them more than it does Moscow.

Recently, for example, the Soviet Union was reported to have bought a large order of IBM-compatible PCs from Peru to augment its own feeble supply of home-built computers.

"If the Soviets need computers, they can buy all they need without any trouble," said Seymour Goodman of the University of Arizona, a leading Western expert on the use of microprocessors in Communist societies. "Some loosening up [of export restrictions] was necessary," he said in a telephone interview. "Decontrolling the export of PCs merely reflects how successful the West has been in putting these machines into use as a common commodity. The technology is so widespread that it has become impossible to control."

The opposing view is that anything that makes it easier for the Soviets to acquire computer technology is a gift to their military effort. "I think we should draw the line at a place where it does minimal military damage," said Richard N. Perle, who resigned last March as a U.S. assistant secretary of defense for international security policy, a position in which he had strongly opposed the transfer of computer and other advanced technology to the Soviet Union. Mr. Perle has not altered that view.

He said in a telephone interview that he feared the relaxation of computer exports would lead eventually to the setting up of joint-venture production facilities in the Soviet Union, an eventuality in which Moscow already has expressed interest. "It's more than a question of letting the Soviets have a few 16-bit PCs," he said. "There's a big difference between buying a few computers here and there and being able to plan to meet major requirements." By allowing the Soviets access to a technology in which they have a commanding lead, he said, Western countries would be fulfilling Lenin's dictum that capitalists will produce the rope needed to hang themselves.

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The widespread private use of personal computers, however, does not appear to be on the Soviets' agenda. Even if they were allowed to do so, people do not have foreign currency to

available at Moscow's only electronics store, on Leninsky Prospekt.

A reporter for Komsomolskaya Pravda told in his newspaper that when he visited the store and filled out an application form for one of the computers, "I've read there are several different versions," he told an assistant.

"You should read less," the assistant replied.

"Why?"

"Because we don't have any computers, and we won't have any."

"But don't you have them on sale from time to time?"

"Not even one."

"The public use of computers barely exists," Mr. Goodman said. "There are certainly not enough machines around for a computer revolution."

Apart from the BK-0010, the Soviets also produce a machine called the Agat, closely based on the Apple II, which is used in schools, and a range of larger computers based on small to medium-sized IBM mainframes of the mid-to-late 1970s.

The easy exchange of information and data made possible by computers in the West does not exist in the Soviet Union.

The only known civilian networking system is the one operated by the Academy of Sciences, for the exchange of scientific data between Moscow and the Academic City, Akademgorodok, outside Novosibirsk. Research centers are highly compartmentalized, according to Western experts. If a researcher or bureaucrat needs to consult a colleague in another institute, he is not supposed to make direct contact. Instead, the request goes through his own director to the director of the other institute and back via the same route.

**E**VEN COMPUTER programmers, according to the experts, are given only the information needed to do their part of a job. Often, they do not know the final purpose of the program on which they are working. By restricting the flow of information, and confining computers largely to official institutions, the Soviet Union misses out on the free-wheeling intellectual ferment that produces the West's software geniuses. There is no Soviet equivalent of the microchip millionaire of Silicon Valley. It is perhaps no coincidence that Hungary, the country that by Western standards is the most liberal in the Soviet bloc, also produces its best programmers.

Despite such handicaps, Mr. Goodman said, the system succeeds in producing some fine computer experts. "It is a big country in which the educational system is oriented toward science and technology," he said. "There is a lot of raw talent around. The Soviet Union has some good hackers, but they are restricted by the hardware they have to use. They have just never been able to work at their full potential."

Mr. Goodman said the Soviet Union is far ahead of China in its application of computers, but is scarcely aware of its growing technology gap with the West. It is a dilemma to which there is as yet no answer. In seeking to reap the benefits of computers in modernizing their economy while minimizing the risk to the system of political control, the Soviets are in the position of wanting the golden eggs without the goose. "They cannot afford to have a computer revolution," Mr. Perle said. "On the other hand, they cannot afford not to."

**BARRY JAMES** is a staff writer for the International Herald Tribune.

## Turning Machines Into Experts

By Richard Sharpe and Margaret Coffey

**L**ONDON — In every organization there is an expert, someone who, with formal or informal recognition, knows more about the business procedures, operating techniques and decisions than anyone else, someone to whom everybody turns. A computerized expert system plays the same role as this human expert.

Until recently, computerized expert systems depended on such complex instructions and needed so much computing power to be effective that they were confined to the most urgent and most profitable applications, mostly military.

Now a movement has started that, within a few years, could make expert systems running on personal computers as universal in use and as easy to manipulate as spreadsheets are today.

Two technical developments in the computing field are bringing the day of universal use of expert systems closer. First, there is the development of more powerful personal computers with more computer processing power and more storage capacity. Second, the computing industry is gaining experience in how to build expert systems and the areas in which they are most likely to flourish.

Once the cost of developing and running an expert system falls fast enough, it will be like having specialist tailor-made experts on tap for each main area of business. Soon, expert systems that guide lawyers through case law, managers through personnel selection, physicians through diagnosis, accountants through tax law, maintenance engineers through repair visits and financiers trying to optimize investment decisions will be commonplace.

In each case, the rules expressed in the practice of a human expert of long standing will have been taken by a knowledge engineer and encapsulated into an expert system on a different way. They will have a common core

of rules to infer from knowledge, but the need to decide in real time will make special demands on the technology.

To achieve the high rates of growth predicted for the market, expert-system development packages will have to come in two types: those tailored to real-time applications along the lines of Systems Designers' work and, at the other end of the scale, those made as cheap and easy to use as the spreadsheet.

A simple consultative-expert system, for a personal computer, to help with personnel selection has been launched for £99, by PAL Software in Britain.

But IBM's Personal System/2, the company's second-generation of personal computers, gives the expert-systems development package vendor a firmer foundation, according to Peter Lewellyn Jones, chairman of Creative Logic. Creative has just launched the expert system development package, Leonardo. The entry-level Leonardo costs £150 and is powerful enough to build a small-to-medium-scale consultative expert system of 1,000 rules.

Logica, the British software house, has taken the advanced version of Leonardo and built it into a computer operations advice package that helps the users of large computers find out where the bottlenecks in performance are.

At both ends of the market the demand for expert systems will expand through one professional group after another. Some groups will write their own expert systems using packages like Leonardo, just as they tackle spreadsheets and personal computer databases. Others will turn to the software houses like Systems Designers and Logica and have a tailor-made system developed for them.

The most conservative prediction is that the expert-system market will grow fivefold over the next five years in Western Europe.

**RICHARD SHARPE** and **MARGARET COFFEY** are London-based free-lance journalists specializing in computers and technology.

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employees' workday begins with the ride to corporate headquarters.

By Errol G. Rampersad

**A**STERAS — The Asia Pacific's largest staff of Asia Scandinavia's largest staff of heavy electrical equipment and vehicles in what is the world's first railway office. Their workday starts with the ride to corporate headquarters and their jobs in Västervik, a former mining town 130 kilometers (80 miles) from Stockholm. The office is equipped with telephones connected to a central telephone system which in turn is coupled to a mobile telephone system. It provides access to every country in the world, as well as personal computers, with which desks in what is considered a special conference room, which is decorated with posters and contemporary prints.

The public use of computers barely exists," Mr. Goodman said. "There are certainly not enough machines around for a computer revolution."

Apart from the BK-0010, the Soviets also produce a machine called the Agat, closely based on the Apple II, which is used in schools, and a range of larger computers based on small to medium-sized IBM mainframes of the mid-to-late 1970s.

The easy exchange of information and data made possible by computers in the West does not exist in the Soviet Union.

The only known civilian networking system is the one operated by the Academy of Sciences, for the exchange of scientific data between Moscow and the Academic City, Akademgorodok, outside Novosibirsk. Research centers are highly compartmentalized, according to Western experts. If a researcher or bureaucrat needs to consult a colleague in another institute, he is not supposed to make direct contact. Instead, the request goes through his own director to the director of the other institute and back via the same route.

**E**VEN COMPUTER programmers, according to the experts, are given only the information needed to do their part of a job. Often, they do not know the final purpose of the program on which they are working. By restricting the flow of information, and confining computers largely to official institutions, the Soviet Union misses out on the free-wheeling intellectual ferment that produces the West's software geniuses. There is no Soviet equivalent of the microchip millionaire of Silicon Valley. It is perhaps no coincidence that Hungary, the country that by Western standards is the most liberal in the Soviet bloc, also produces its best programmers.

Despite such handicaps, Mr. Goodman said, the system succeeds in producing some fine computer experts. "It is a big country in which the educational system is oriented toward science and technology," he said. "There is a lot of raw talent around. The Soviet Union has some good hackers, but they are restricted by the hardware they have to use. They have just never been able to work at their full potential."

Mr. Goodman said the Soviet Union is far ahead of China in its application of computers, but is scarcely aware of its growing technology gap with the West. It is a dilemma to which there is as yet no answer. In seeking to reap the benefits of computers in modernizing their economy while minimizing the risk to the system of political control, the Soviets are in the position of wanting the golden eggs without the goose. "They cannot afford to have a computer revolution," Mr. Perle said. "On the other hand, they cannot afford not to."

**BARRY JAMES** is a staff writer for the International Herald Tribune.

Richard Sharpe and Margaret Coffey are London-based free-lance journalists specializing in computers and technology.

## Technology Workplace

## Swedes Catch the Office Express

Employees' workday begins with the ride to corporate headquarters.

By Errol G. Rampersad

**V**ASTERAS — The Asca Pendeln that pulls out of Stockholm's central railroad station on weekdays has added a new dimension to commuting by bringing the office to commuters.

Clocking in on Platform 6 at 7:40 A.M., the office staff of Asca, Scandinavia's largest maker of heavy electrical equipment, take to their desks in what is the world's first and only mobile office. Their workday begins with the ride to corporate headquarters and their jobs in Västerås, a former Viking trading town 130 kilometers (80 miles) away.

The luxuriously appointed carriage, outfitted at a cost of 4 million Swedish kronor (\$6.7 million), can seat 40 passengers. It is equipped with 26 ergonomically designed work stations, a special conference room and a lounge, which is decorated with postcard prints and contemporary prints.

The coach is owned by Asca and is the first private passenger train to run on the state-owned railroad network, Statens Järnvägar.

The work stations are equipped with telephones connected to a conventional telephone exchange, which in turn is coupled to a mobile telephone system. It provides access to any country in the world, as well as Scandinavia's ubiquitous cellular phones in car and booth. Riders can use electric typewriters as well as personal computers, with which they can gain access to data bases at corporate headquarters in Västerås. Commuters, armed with their diskettes, are in touch with a specially linked computer throughout the ride.

The office-on-wheels was the brainchild of 34-year-old Ann Larsson, a member of Asca's business development and corporate planning division, herself a Stockholm-Västerås commuter. "It was a joke at first," she explained. "Then we thought, why not? It seemed crazy but it made sense."

Mrs. Larsson, who recalled her dread of having to drive from Stockholm to her office in Västerås through the ice and snow during the long and dark winter, said the idea of a mobile office came to her after she switched to commuting. "Many of us who preferred to live in the capital were not



Swedish commuters get all the amenities of the office as the scenery goes by.

happy about the three hours we wasted every day traveling back and forth to Västerås," she recalled. "I felt a lot of valuable time and manpower was being wasted on commuting. I realized this time could better be used to benefit both employer and employees." She presented the concept of a mobile office to Percy Barnevik, president and chief executive officer of Asca, who was receptive to the idea.

The train also ferries visitors traveling from Stockholm and Västerås executives going to the capital for meetings and conferences. It travels back and forth six times a day.

Employees purchase a regular second-class roundtrip ticket, costing 160 kronor a day. Asca pays one-third and the rest is tax deductible. Half the time spent traveling—the trip to work—is deducted from the day.

"As a manufacturer of locomotive assemblies, it is somewhat easier and, certainly, less costly for Asca to accept the idea of an office on rails," a commuting executive said.

"Moreover, cooperation between private enterprise and the state-owned railways is much easier here in Sweden, where labor relations have always been harmonious."

"The railway people have been very enthusiastic and have cooperated in every way," Mrs. Larsson said.

So too has Televerket, the nationalized telephone company. There are 26 phones aboard and one can dial anywhere in the world.

The mobile office is run by a staff of four, working in two shifts, operating the switchboard and making sure things run smoothly. On a recent 7:40 run from Stockholm, Eva-

dene documentaries on the Asca Pendeln

Lena Nilsson and Karolina Frielingdorf went about their duties with customary efficiency, oblivious to the towering pines and sparkling lakes that flashed by. "We have gotten so used to our 'office' that we hardly ever miss the atmosphere of the conventional workplace," they said.

**A** SEA HOPES that its investment in the pendeln would help to attract the capital's university graduates to its offices in Västerås, which, with its 120,000 inhabitants, is a one-company — Asca — town. Stockholmers find it rather boring since there are few amenities for nightlife.

Last year, Asca, founded in 1883, ranked among the world's 10 leading electrical and electronics enterprises, with operations conducted through 346 companies, with a work force of 71,000 employees. Approximately 70 percent of its sales are outside of Sweden.

In a merger with Brown, Boveri & Co. of Baden, Switzerland, announced last month, Asca now becomes the largest in Europe, with a joint work force of 160,000.

Greeting the announcement of the merger on a recent ride, Mrs. Larsson laughed at the suggestion of a railborne office between Baden and Västerås.

**ERROL C. RAMPERSAD** is on the editorial staff of the International Herald Tribune.

## Fully Automated Factory Goes Beyond the Dream

By Beth Karlin

**W**ASHINGTON — For most international companies, the paperless factory remains a dream. Pencil-pushing and paper-shuffling continue to inhibit productivity gains. But a handful of forward-looking companies are investing heavily to make automation a reality. They are computerizing and integrating everything from sales to manufacturing to shipping. And they are doing it on a worldwide basis. Early results are impressive.

At Tandem Computers, for example, productivity increased 340 percent and work-in-process throughput decreased from 19 weeks to less than two weeks as a result of extensive automation at its Watsonville, California, facility. Tandem's high level of office and manufacturing automation extends far beyond Watsonville to encompass—and end via a sophisticated network—three domestic assembly plants and another in Neufahrn, West Germany, according to Jack Cundari, Watsonville plant manager.

Successes by Cupertino, California-based Tandem and other innovators are encouraging more companies to expand computer integrated manufacturing. Such firms as ICL of Britain, N.V. Philips of the Netherlands and Siemens of West Germany are following suit. Indeed, European spending for automation is growing at a faster rate than in the United States, according to Dataquest Inc., a San Jose, California, market research firm.

Europe's speedier growth is due at least in part to the fact that it is making up for a slower start. But the declining value of the dollar, and corresponding increase in the price of foreign-made products in the United States, also is contributing to the new enthusiasm for automation in Europe. The only real way to lower prices, without lowering profit margins, is to cut production costs.

"They've had to automate," says David Penning, director of Dataquest's manufacturing automation service. "And while they've been making real changes, we've just been fooling around with currency. Once again, we've shot ourselves in the foot."

Total European spending for automation, including computers, software and manufacturing systems, will more than double to \$7.1 billion this year, from \$3.3 billion in 1983, according to Dataquest. By 1991, Dataquest predicts, European automation investment will climb nearly 50 percent more to \$28.3 billion.

The benefits of computer integrated manufacturing are many, says Tandem's Mr. Cundari. Assembly and test operations at the computermaker's Austin facility, for instance, are entirely tracked and controlled without paper. Wands are used to read bar code labels affixed to subassemblies and other work in process. As a result, the computer records—and any worker who wants to know can instantly learn—where the work has been, where it is and where it is headed.

Via computer, Tandem officials can learn everything from the raw material to finished goods inventories at any of the other plants.

## How U.S. Systems Score Abroad

Foreign sales of American-made automated manufacturing equipment have grown from \$9 billion in 1982 to \$17 billion this year. By 1991, the market could exceed \$29 billion.

Destination	1982	1987*	1991*
United States	10	18	28
Western Europe	3	7	10.5
Asia	4	7.5	14
All others	1	2.5	5

Source: Dataquest

European demand for automation equipment has created profitable new markets for U.S. firms, particularly in computer-aided design and manufacturing (CAD/CAM). CAD/CAM is the essential first step in computer integrated manufacturing. The data generated by designers and engineers as they fashion products on a CAD system's video screen provide much of the information that is necessary to compute the overall production planning effort. This includes manufacturing the tools, ordering the raw materials and scheduling the production runs.

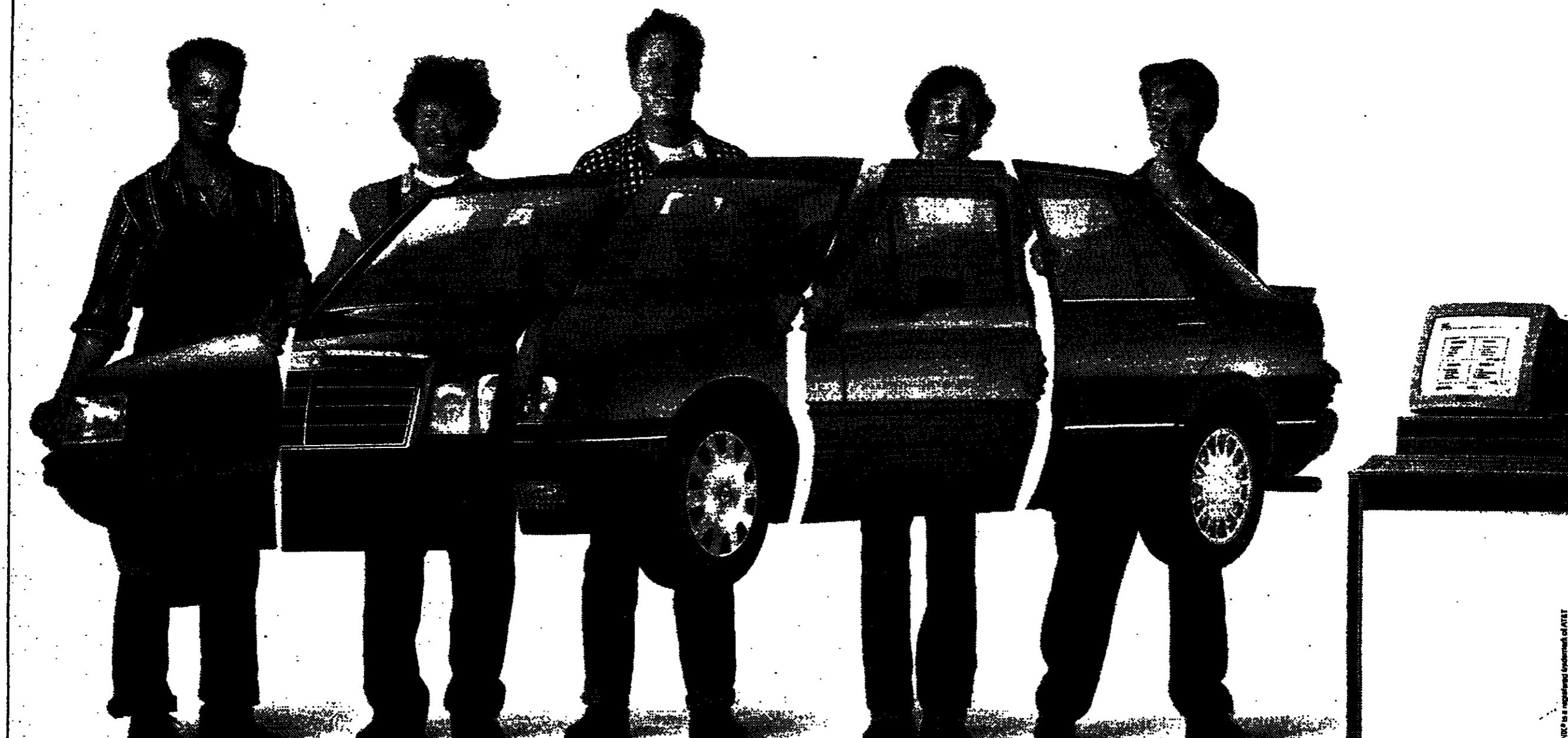
"Exports [of CAD/CAM equipment] have grown at a tremendous pace," says Deborah Harris, an economist with the International Trade Commission. Foreign sales of U.S. products have skyrocketed from about \$243 million in 1980 to about \$1.6 billion in 1986, she said. U.S. CAD/CAM vendors dominate 70 percent of the West German market, for example, and 75 percent of the British market.

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**BETH KARLIN** is a Washington-based journalist who contributes regularly to *Electronic Business* and other technical publications.

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## Technology Research

## How a Typo Set Off a Scientific Scramble

Continued from page 7

spread through the scientific world, the journal's editors denied vehemently that they had divulged the secret. They privately expressed anger at Mr. Chu, suspecting an intentional deception on his part to mislead competing researchers. Mr. Chu, in turn, earnestly denies any deception. He explained the mistake as a typist's error, and anyway, he says, he corrected it two weeks before publication.

The secrecy, the prelance, the jockeying for science's top prize, the raw displays of ego and ambition — all these have risen nakedly to the surface in recent months. For researchers, the Nobel prize is certain, but the precise names it will honor are not. For industry, a patent battle likely to burn through the next decade will hinge on the events of this year.

Still, when these conflicts recede from memory, a story will remain of scientific discovery in its purest form. The heroes will be a few obsessive physicists driven to understand the strange, shimmering electronic qualities of crystalline matter and who chose a path that their colleagues either scorned or overlooked. They blended intuition with experiment, mixing weeks and months of patient trial-and-error with an occasionally uncanny insight into structures too small to see.

Only a year ago, superconductivity belonged to the obsessive few. It was a piece of scientific esoterica, tantalizing but obscure, for good reason. It seemed to be strictly a creature of the extreme cold near absolute zero (approximately 459.6 degrees below zero Fahrenheit).

For most practical purposes, the necessity for extreme cold made superconductivity forbiddingly expensive. The search for materials that become superconductors at warmer temperatures progressed slowly, sometimes proceeding by just tens of a degree at a time. By 1973, the temperature of superconductivity had been raised to 23 Kelvin (minus 437 degrees Fahrenheit). But there progress stopped. By the 1980s, the field was dying.

□

enhance the calcium formation that accelerates bone recovery, scientists say.

So far, three distinct ways have been devised to deliver the electric current to the needed area. No matter which technique is used, the process takes about six months for the average patient.

The direct current method commonly uses an electrode that is implanted at the bone and delivers a steady supply of current to the fracture. A small battery is implanted into the soft tissue nearby. The device runs 24 hours a day and costs \$1,895, not including the surgical dis-

ease.

Such prospects have caused competition to heat up in the nascent industry. It was only in 1979 that the Food and Drug Administration first approved the technique for commercial application and since then companies have been rushing for FDA approvals.

Among the major players today are Electro-Biology Inc. of Parsippany, New Jersey; American Medical Electronics Inc. of Dallas; Pfizer Inc. and Zimmer Inc. in Warsaw, Indiana, a unit of Bristol-Myers Co.

Among the attractions of the process, which no one fully understands, is that it seeks to imitate natural electrical forces within the body. In 1957, two researchers, E. Fukada and I. Yudasaka of Japan, described the electrical current that was known to be generated by bones when placed under stress. Since then, research has centered on duplicating the various electrical signals produced by the body to control various functions, according to C. Andrew L. Bassett, emeritus professor of orthopedic surgery at Columbia University.

"What we're packaging is a mimicry of what the body puts out naturally," Mr. Bassett said. He stressed, however, that the electrical signal used by the devices bears no resemblance to the electromagnetic fields produced by electric power lines, which some scientists suspect increases the risk of cancer to those living within the field's range.

In speeding bone recovery, it takes only a small amount of electrical stimulation, equal to that of only about two watch batteries, to

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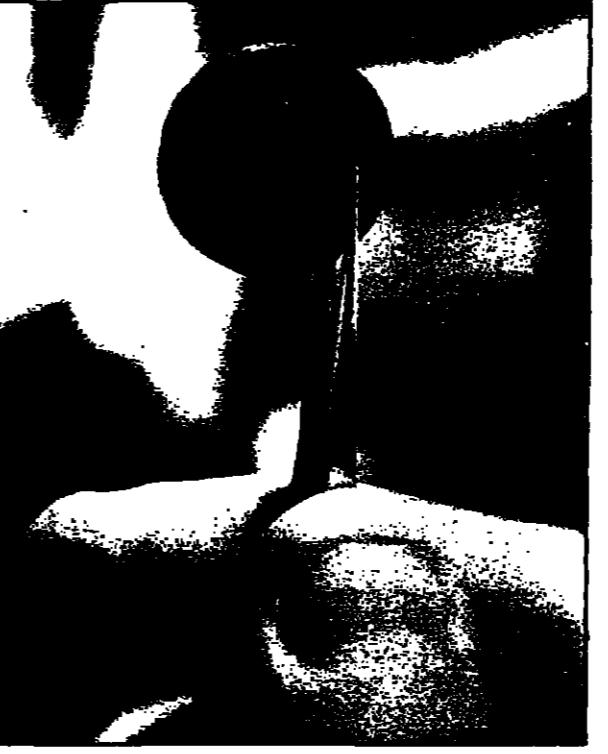
J. Georg Bednorz and Karl Alex Muller in their IBM research laboratory in Zurich.

## Heating Up

Sept. 1987 240K\*

When advances occurred (K=Kelvin)

Feb.	98K
1986	35K
1973	23K
1944	15K
1911	4K
	* approximate



Barbara Lippin/Picture Group  
A disc of yttrium, the superconductive material.

norz and Mr. Muller did, and, on Jan. 27, 1986, they struck gold.

As Mr. Bednorz cooled his sample, measuring a current passing through tiny wires attached to it, he discovered a sharp drop in resistance. By April, the two men had raised the record for a superconductor from 23 Kelvin to 35 — still 397 degrees below zero Fahrenheit. That was not warm enough for practical applications, but it was warm enough to rekindle interest in superconductivity's future.

Mr. Muller and Mr. Bednorz made no announcement. They did not even tell scientists at other IBM laboratories. They submitted a modest paper, not to Physical Review Letters but to the German journal, which they knew would remain unread by most physicists. One reason for their caution was that the history of superconductivity had been littered with false alarms. Another was that they wanted to continue their work in peace.

Mr. Chu's group had a routine. The researchers divided up the journals and were responsible for catching any news of even the remotest significance. Zeitschrift für Physik is not an obscure journal, but at places like Bell Laboratories it went unnoticed. Mr. Chu, calling his staff together that morning last November, had a head start.

Even with the Zurich recipe at hand, Mr. Chu was operating almost blind. No one knew exactly what the desirable crystal structure was because four elements mixed together can produce dramatically different substances depending on how they are baked or how they are cooled. Mr. Muller and Mr. Bednorz had stumbled upon a particular crystal by an accident of preparation.

Mr. Chu found that he could duplicate the accident, but his first samples of the material were unstable. One day they would prove to be superconductors; four days later, after reacting with water vapor and carbon dioxide in the air, these porous ceramics would again be worthless.

In the middle of this work, at a scientific meeting in Boston last Dec. 4, Mr. Chu gave a long-scheduled talk on an earlier oxide superconductor and, at the end, described his latest results with the new materials. Koichi Kitazawa, a physicist at the University of Tokyo, was in the audience. His group, too, had read the IBM paper and begun a race to pursue its promise. After telephoning Tokyo for the latest data in his lab there, he told the Boston meeting about his results so far.

Mr. Chu took him aside and asked, "Is your sample stable?"

Mr. Kitazawa looked at him. "It depends," he said.

"Four days?" Mr. Chu said.

"Yes."

The word was out. Mr. Chu's group and the Kyoto group quickly learned how to stabilize the IBM material. Scientists at Bell Laboratories invited Mr. Kitazawa to present his latest data there, and he did so — traditional scientific

openness still outweighed the less familiar urge for competitive secrecy. Bell's scientists hastily assembled a team. Like Mr. Chu, they quickly confirmed the Zurich results.

But for all these groups and the many others who now entered the fray, the question was whether the hint contained in the Zurich discovery could be turned into still other materials that would act as superconductors at even higher temperatures. The difference between 23 Kelvin and 35 was historically enormous, but for applications it was not enough.

The next goal was 77 Kelvin, the temperature that would allow liquid nitrogen to be used as a coolant. Liquid nitrogen is cheap — the supply is as abundant as air.

Each scientist who considered the possibility of a liquid-nitrogen temperature superconductor brought to the problem a different set of blemishes and a different style of experimentation. As a first step, many substituted new elements for the atoms of barium in the Swiss compound. The Bell researchers immediately tried the closely related element strontium, and strontium worked.

Mr. Chu did a further test. He placed samples of the IBM material under high pressure, using a piece of equipment he calls his "bomb" — a custom-made, lipstick-sized container capable of creating within it pressure 200,000 times that of the Earth's atmosphere.

Mr. Chu had "squeezed" many materials over the years, knowing that pressure reduces the distances between atoms. Having squeezed earlier superconducting oxides, he knew what to expect: not much. In this case, however, he found that pressure dramatically raised the temperature of superconductivity, to 40 Kelvin, then 52, then 57. There were even fleeting, transitory hints of declining resistance at temperatures above 70.

Mr. Chu next tried substituting smaller atoms: strontium and then calcium. With calcium, though, the temperature at which superconductivity occurred fell back down, to a discouraging 20 Kelvin. "So we said we should do something else now — no hope with that kind of structure."

The materials he was working with were rough, filled with impurities and visible dislocations. Mr. Chu tried growing pure single crystals of the materials, but he quickly realized that he lacked the equipment and expertise to compete with the big laboratories.

In January, looking over his data, he found one more crucial clue. The impure materials produced hints of superconductivity at high temperatures, but as the experimenter cooled the samples, the materials were slow to reach zero resistance. When the researchers succeeded in making purer versions of these materials, however, even though superconductivity came more suddenly, the hints at the higher temperatures did not appear.

One especially impure sample had come out of the furnace red on the outside instead of shiny black, and green, blue and white on the inside. It was clearly a mixture of different substances and different crystalline arrangements of substances that were otherwise chemically the same. Mr. Chu insisted that this bastard ceramic be tested, and it showed a faint signal that it contained some as-yet-discovered superconducting substance.

By now he had expanded his team to include a group at the University of Alabama, headed by his former student Maw-Kuen Wu. This time, the scientists tried a different substitution. They mixed in the element yttrium for IBM's lanthanum. At first the composition was all wrong. The furnace temperature had to be changed.

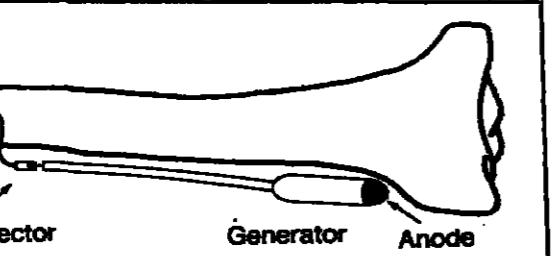
On Jan. 29, however, testing a sample at different temperatures, Mr. Wu saw the unmistakable drop in resistance at more than 90 Kelvin, only 298 below zero Fahrenheit. A few days later, after due consultation with his university's patent lawyers, Mr. Chu made his incomplete announcement.

When Mr. Chu's March paper finally appeared, several groups succeeded over a single weekend in duplicating the yttrium material. Several succeeded in purifying the compound and identifying its precise structure.

The theorists struggled to understand a superconductor that performed at theoretically improbable temperatures. Experimenters found a dozen more compounds sharing the crystalline form of Mr. Chu's yttrium material.

Mr. Chu and others began talking openly of the next grail, perhaps already in sight, a room-temperature superconductor.

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The New York Times  
Diagram shows a cathode that is cut into the bone, spanning the broken area. A wire connects it to a battery-powered generator. The circuit is completed by the body itself. The process is monitored by a remote readout.

## Electromedicine Gains In Respectability, Use

By Peter H. Frank



An American Medical Electronics transducer slips over leg, sending electric current through the bone.

Currently, fewer than 20,000 patients a year are using an electric stimulator as part of their treatment. The result is a relatively small \$50 million annual market. But that could rise dramatically.

Each year in the United States, for example, there are 300,000 cases of fractured tibias, the larger of the two bones between the knee and the ankle. Of these fractures, 100,000 are believed to be of the nonunion variety and prime candidates for treatment with electrical current.

And some scientists and analysts predict that the market's potential could increase a hundredfold if the electric-current technique can be successfully applied to other bone dis-

ease. Such prospects have caused competition to heat up in the nascent industry. It was only in 1979 that the Food and Drug Administration first approved the technique for commercial application and since then companies have been rushing for FDA approvals.

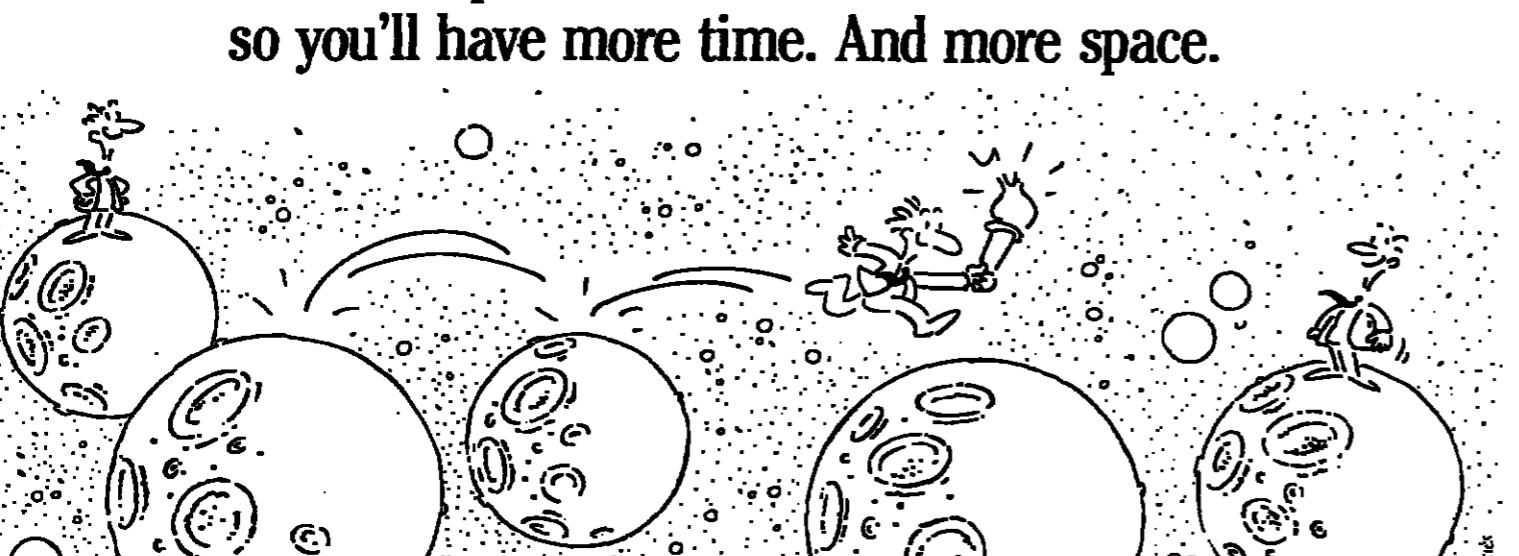
Among the major players today are Electro-Biology Inc. of Parsippany, New Jersey; American Medical Electronics Inc. of Dallas; Pfizer Inc. and Zimmer Inc. in Warsaw, Indiana, a unit of Bristol-Myers Co.

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## Japan Pushes Research Efforts

By Linda Hales

P ARIS — Outside the laboratories, governments are racing to aid superconductor research amid concern that failure to exploit the new technology could doom a nation to second place in tomorrow's global marketplace.

Japan's Ministry of Trade and Industry announced two weeks ago that it would seek about 2 billion yen (\$14 million) to foster

development in the coming fiscal year — more than six times the current budget of 300 million yen.

The decision came one month after President Ronald Reagan announced an "11-point Superconductivity Initiative" to speed product development in the United States and "give ourselves a fair share in the world marketplace."

The Soviet Union has also developed a national plan to support superconductor research.

Although scientists say superconductive materials are 5-10 years from large-scale commercial application, the expected rewards may be as dramatic as the invention of transistors and integrated circuits. Some experts already estimate their commercial value could reach \$20 billion annually by the year 2000.

But U.S. business, now smarting from Japan's success with semiconductors, worries that Japanese companies could turn research into marketable products faster and more cheaply.

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LINDA HALES is the International Herald Tribune's editor of Technology Quarterly and Special Reports.

would share findings on the level of basic science.

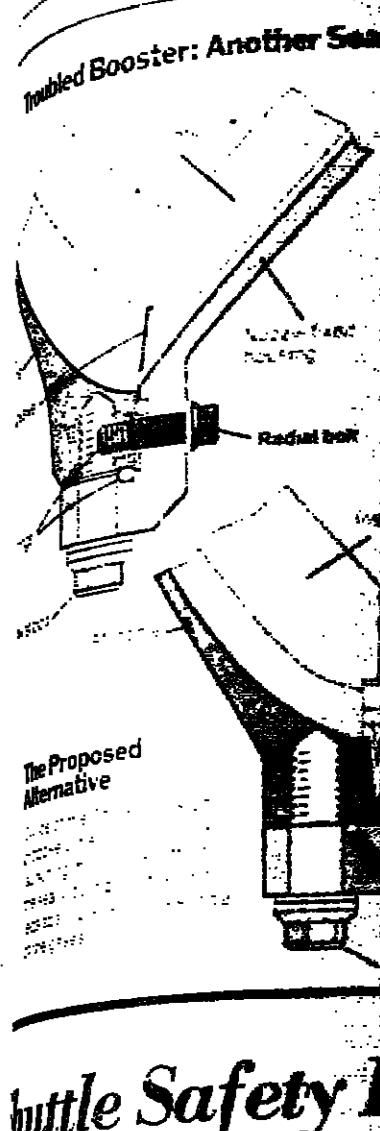
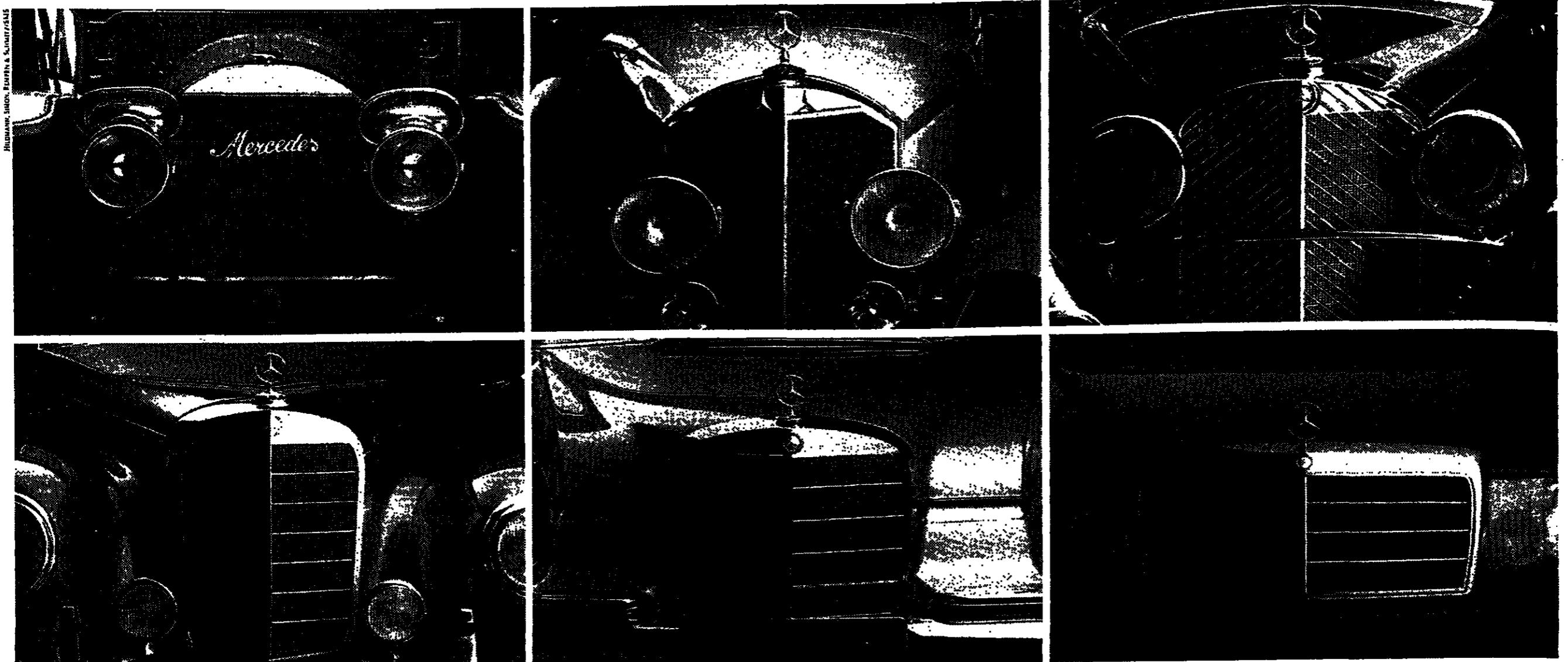
A report released by MITI in late August also said universities and national laboratories, not corporations, were likely to continue to lead Japanese research work.

Shoji Tanaka, a leading researcher in superconductivity and vice chairman of an advisory committee to MITI, has said that MITI is aware that taking a nationalistic view of superconductivity could lead to a stronger reaction from the United States than the semiconductor issue.

And in a recent article in *Yomiuri Shimbun*, Mr. Tanaka, who is a professor of physical engineering at the University of Tokyo, argued that Japan and the United States "should prevent monopoly control of superconductors and ensure this asset is used for humanity."

But U.S. business, now smarting from Japan's success with semiconductors, worries that Japanese companies could turn research into marketable products





## Shuttle Safety

By David E. Sanger  
Washington Bureau Chief  
Goddard's engineers dissected the shuttle's booster rocket assembly, debate continues over the placement of the rocket's two main engines. One of the two main engines has been moved to the side of the shuttle's nose cone, where it is more exposed to the flow of air. The move is intended to reduce the risk of damage to the shuttle's thermal insulation.

The move does not center on the engine itself, but on another part of the assembly at the aft end of the nose cone. The nozzle is attached to the engine before the two connect, and the attachment "cold-flow-seal" is one of some of the most vulnerable parts of the shuttle's thermal insulation. It has been seen from space as a major hazard as it passes through the atmosphere.

Members of the search committee have been testing a proposed alternative design and its

metal-to-metal bolts has been effective, even though the rubber seal is not extra protection. It will work to demonstrate it will work as well as it did.

We are testing a new design and its

Members of the search committee have been testing a proposed alternative design and its

## Possible

WASHINGTON—Body proteins in malaria, a finding that may save hundreds of millions of lives. Studies indicate that a protein in the malarial parasite may be responsible for the disease. Researchers will study the protein in Geneva to find other agents that may be involved in malaria, according to the World Health Organization.

There are an estimated worldwide each year.

## Birth De

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Not size but innovation, high-tech-

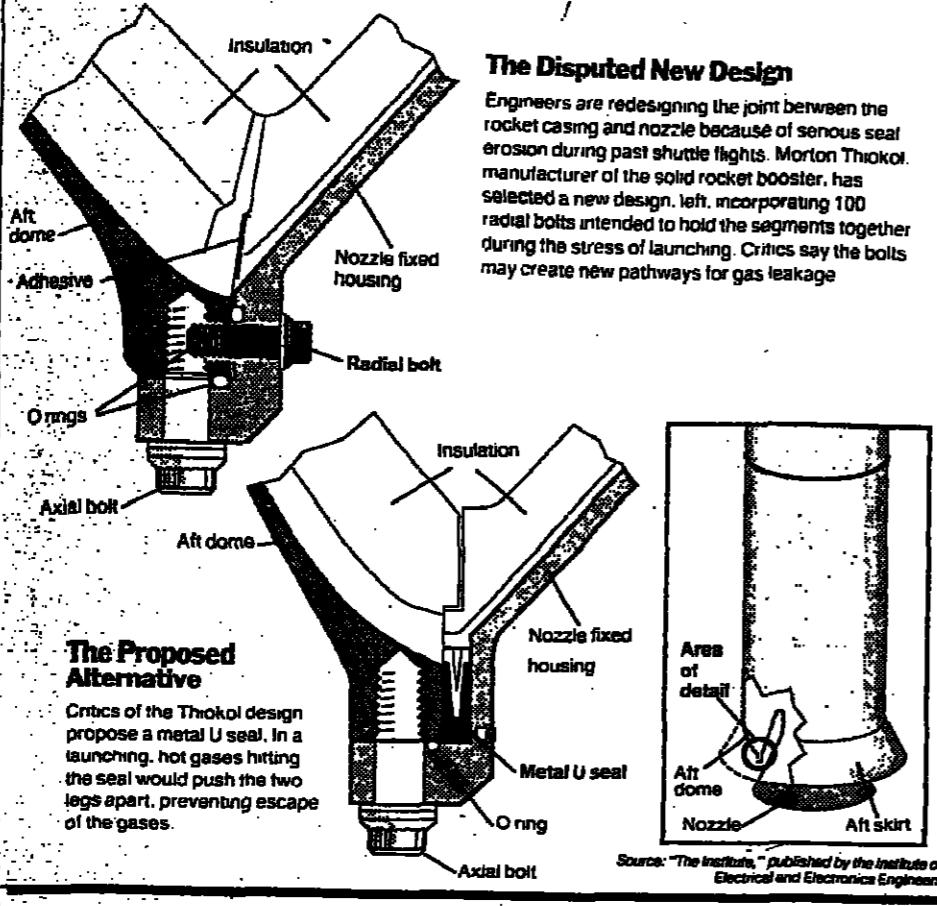
nology and high quality are important for the successful development of our company and for strengthening our future competitiveness. So we make sure that in the future good ideas will not become a matter of chance and innovation will remain our tradition.



## SCIENCE

## The Surgical Saga of the Siamese Twins

Troubled Booster: Another Seam Under Scrutiny



## The Proposed Alternative

Critics of the Thiokol design propose a metal U seal. In a launching, hot gases hitting the seal would push the two legs apart, preventing escape of the gases.

## Shuttle Safety Debate Persists

By David E. Sanger  
New York Times Service

VEN AS engineers dissect the space shuttle booster rocket fired in Utah recently, debate continues over one element of the rocket redesign that some engineers suggest poses as many hazards as it eliminates.

The debate does not center on the joints that failed in the Challenger accident, but on another crucial seam, at the end of the rocket, where the nozzle is attached. In shuttle flights before the Jan. 28, 1986, accident, the awkwardly shaped "nozzle-to-case" joint was the site of some of the most serious in-flight erosion of safety seals. Revamping the nozzle joint, which cannot be seen from outside the rocket, has been one of the stickiest problems facing Morton Thiokol Inc., the manufacturer.

A new design, incorporating an extra O-ring, 100 bolts to hold the joint together, and other changes, has been adopted by Thiokol with the endorsement of Allan J. McDonald, one of the Thiokol engineers who warned against launching the Challenger. But the new design has been criticized by Roger Bousjoly, a former Thiokol engineer who also argued against the ill-fated Challenger flight.

Both men have a significant stake in their opinions: Mr. McDonald serves as chief of Thiokol's redesign team and Mr. Bousjoly resigned from the company after the disaster, filing suit against it for fraud and defamation.

The engineers' disagreement was a subject of informal discussion last week among rocket specialists who gathered in the Utah desert to watch the first test-firing of the revamped rocket. While most experts concluded that the path chosen by Mr. McDonald's team at Thiokol would probably work, they said Mr. Bousjoly had pointed out real weaknesses. Even the independent National Research Council overseeing the redesign has its doubts about Thiokol's choices. At its probing, the company has issued a subcontract to Vetcro Gray Inc. of Houston to design and test an alternate nozzle joint that substitutes high-temperature metal alloy seals for the primary rubber O-ring used in the Thiokol design.

"If we were starting from scratch and had plenty of time, the metal seal would probably be the way to go," one member of the panel said last week, insisting on anonymity. "As it is, the metal seal is the first backup plan."

Under the pressure of launching, the two segments sometimes separated a fraction of an inch, and hot gases began to erode the rubber O-rings. Had those rings burned entirely through, few doubt the shuttle would have been destroyed.

To prevent the problem from recurring, engineers have redesigned insulation around the joint using a "seal" that should prevent any hot gas from getting near the O-rings. A third O-ring has been added as a "wiper seal" to prevent contaminants from getting into the joint during assembly. And most importantly, 100 bolts have been added around the joint.

Mr. Bousjoly's criticisms are focused on the new radial bolts in the redesign; the bolts are placed between the primary O-ring in the joint, intended to stop the flow of hot gas, and the secondary O-ring that provides a backup.

"They cripple the redundancy of the secondary seal in 100 places," Mr. Bousjoly said. In other words, each bolt provides a potential leak path for any hot gas that makes it around the primary O-ring.

"It's like tightening the bolts on a car wheel," he said. "You do one side, then go to an opposite bolt and tighten that." But as each of the 100 bolts in the nozzle joint is connected, the joint itself could be deformed, "creating tremendous stresses in the whole part."

"Murphy's Law awaits them," he maintained. "If they're right, then they're heroes and I'm a bum. And that's O.K. If I'm right, more people could die."

Mr. McDonald responds that the

## The Disputed New Design

Engineers are redesigning the joint between the rocket casing and nozzle because of serious seal erosion during past shuttle flights. Morton Thiokol, manufacturer of the solid rocket booster, has selected a new design, left, incorporating 100 radial bolts intended to hold the segments together during the stress of launching. Critics say the bolts may create new pathways for gas leakage.

## The Proposed Alternative

Critics of the Thiokol design propose a metal U seal. In a launching, hot gases hitting the seal would push the two legs apart, preventing escape of the gases.

## IN BRIEF

## Possible Key Found to Malaria Deaths

WASHINGTON (AP) — Scientists have discovered that a natural body protein is likely a major cause of the deadliest complication of malaria, a finding that suggests that blocking the chemical's action might save hundreds of thousands of lives each year.

Studies indicate a protein called tumor necrosis factor (TNF) or cachectin is an essential element in highly fatal cerebral malaria, said researchers with the World Health Organization and the University of Geneva in Switzerland. Blocking the protein's action with antibodies or other agents might be a new way to treat the most fatal complication of malaria, according to a report in the journal Science. Estimates are that cerebral complications account for more than half of all malaria deaths even though the condition develops in less than 1 percent of cases overall.

There are estimated 100 million estimated new cases of malaria worldwide each year, with one million resulting in death.

## Birth Defect-Alcohol Links Studied

CHICAGO (UPI) — Pregnant women who have one or two drinks a day do not put their babies at greater risk for most birth defects but even small amounts of alcohol may be linked to one malformation, according to scientists of the National Institute of Child Health and Development.

They analyzed the drinking habits and pregnancy outcomes of 52,870 women and found that those who had two or more drinks a day had the same risk of birth defects overall as women who did not drink. Binge drinking, not drinking during the week but drinking seven or eight drinks on a weekend, was cited as most dangerous, with effects including spontaneous abortions, still births, low birth weights and other risks.

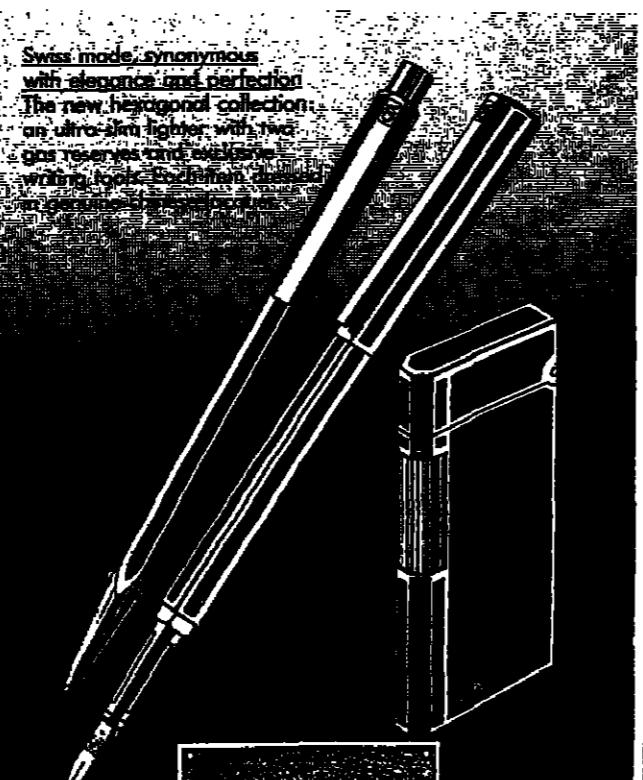
"We did find a direct relationship between the amount of drinking — even in light amounts — and an increased risk of congenital malformations," said Dr. James Mills, an institute epidemiologist. "My recommendation to women would still be don't drink when you're pregnant. We still clearly do not know enough about this."

## Starfish Used in Male Pill Research

DURHAM, New Hampshire (AP) — A University of New Hampshire zoologist is using the common northern starfish in research aimed at producing a contraceptive pill for human males.

Charles Walker is studying sperm production by starfish because, unlike human males, it produces sperm only once a year. He is trying to find the chemical trigger that tells the cells when to divide and form sperm. He believes that a similar process occurs in humans and a pill to block a chemical trigger should have fewer side effects than hormones such as steroids.

The starfish has the advantage of having two organs in each of its five legs where sperm are produced, making it a useful lab specimen. Mr. Walker said the starfish also is in a more direct evolutionary line with humans than the fruit fly and other animals used in similar research.



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By Jane E. Brody  
New York Times Service

THE historic surgery Saturday and Sunday that successfully separated 7-month-old Siamese twins joined at the head actually began in West Germany five months ago. Last spring, a team of physicians from Johns Hopkins Hospital in Baltimore visited the infants and devised a unique operative plan that they thought could separate them without causing lasting brain damage.

Almost immediately, the doctors began a procedure to slowly stretch the babies' skin sufficiently to cover an operative wound.

Then came months of preparation and lengthy dress rehearsals using dolls attached at the heads with Velcro. One small mistake could mean permanent damage or even death for one or both of the otherwise healthy babies.

Dr. Mark Rogers, the physician who choreographed the final plan, likened it to "a complex military maneuver" in which anesthesiologists, cardiac surgeons, neurosurgeons, plastic surgeons, nurses, technicians and electricians were "trained to provide the proper input" when it was needed.

The separation surgery was scheduled for the Labor Day weekend, when no elective surgery is planned and the 70 professionals needed in the cramped operating room, the 70 others in support, and the 60 units of blood and blood components required could be dedicated to the twins.

Independent of the success of this operation, our ability to plan something as complex as this taught us that we can accomplish much more than any of us thought we could," Dr. Rogers said after completing the 22-hour procedure.

Late Monday afternoon, 36 hours after their surgical ordeal came to an end, the babies, Patrick and Benjamin Binder, were in critical but stable condition in the pediatric intensive care unit.

After the operation, which ended at 5:15 A.M. Sunday, the extensive head wounds, approximately 16 inches (41 centimeters) in circumference, continued to ooze blood, according to Dr. Ben Carson, the pediatric neurosurgeon who had surgically divided the shared brain tissue. But he and his colleagues had been able to stop the extensive bleeding that had complicated the end of the difficult surgery.

To try to prevent permanent brain damage, a complication of previous attempts to separate Siamese twins joined at the head, the Johns Hopkins team had combined

a series of routine but advanced medical maneuvers that put the brain temporarily on hold. The babies were placed on heart-lung machines and cooled to reduce brain function to near-zero. At the critical moment, when Dr. Carson had to divide the shared brain cavity and drainage vein, the cardiac surgeons, Dr. Bruce Reiss and Dr. Duke E. Cameron, drained all the blood from the babies' bodies and stopped their hearts.

Dr. Carson and Dr. Donald Long, the chief of neurosurgery, had one hour to accomplish final separation, reconstruct the divided brain cavities and veins and restart the hearts and blood flow. Longer than that and the oxygen deficit could result in permanent brain damage, Dr. Carson said.

"As we got to 45 minutes, there was a lot of tension in the operating room. But we made it. One baby

was done in 56 minutes and the other in 63," Dr. Carson said.

Then came an even scarier moment. Once the babies' hearts were restarted, they bled profusely from all the tiny blood vessels in the brain that had been severed during the surgery. Pint after pint was needed, nearly exhausting the supplies, participants in and out of the operating room volunteered more.

At the same time, the babies' surgically traumatized brains began to swell dramatically.

So it was decided to end the surgery as soon as possible, rather than pursue the original plan to fit the babies immediately with custom-designed metallic mesh skull coverings.

According to Dr. Craig Ducreux, the plastic surgeon who had designed the coverings using a three-dimensional model generated by a Cermex computer, a second operation to create a cosmetically acceptable skull will be done at a later date, assuming the babies continue to recover normally. Once in place, the babies' skull bones will grow into and around the mesh, which will never require removal, the plastic surgeon said.

Before the separation surgery could be undertaken, a section of the hospital needed to be rewired. "We tried to anticipate everything," Dr. Rogers explained.

"Like what would happen if there were a power failure during the surgery. With all the machines we were using, we could easily have overloaded the operating room's electric system."

But throughout the planning, the central concern remained the babies' neurological status. "We decided in advance not to proceed unless we thought we could separate them without compromising the neurological function of either baby," Dr. Rogers said. Until the infants' brains were actually exposed during the operation, the surgeons could not be certain that parts of critical brain tissue, such as the vision center, were separate.

Dottie Lappe, the acting head nurse of the pediatric intensive care unit, who cared for the Binder babies before their surgery as well as after, described them as "happy, smiling, playful infants who laughed and cried like other babies." Except for their immobility, she said, they were at the right developmental stage for their age.

"Everything in the surgery went as planned and as well as we could have hoped for," Dr. Carson said. "The rest is up to God."

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FROM AUDIO EQUIPMENT  
THURSDAY, SEPTEMBER 10, 1987  
INTERNATIONAL MARKET

Company 'Lifers' In  
their Maximum Season

B. SHERRY BUCHAN

*London — To be a one-company employee type was once the safest way to live one's working life.*

*Now, with mergers, takeovers and re-*

*structuring, employees to lose their*

*jobs through no fault of their own.*

*For some who rise through the*

*ladder, it's a good place to be.*

*But for others, it's a bad place to be.*

*One result came from Korn/Ferry International's 1987 survey of*

*U.S. chief executive officers.*

*It shows that 21 percent of British chief*

*executives at present company more than 30 years*

*in the U.S. figure.*

*In what about those who do not make it to*

*Japan manufacturing companies, such as*

*British Chemicals, British Steel Group,*

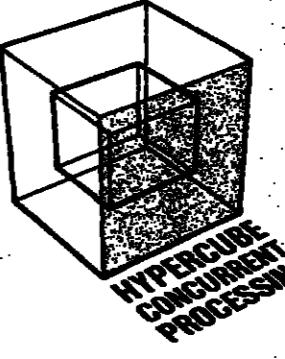
*Volvo AB, where 51 percent of senior managers, recognize the*

*value can lose motivation.*

*Supercomputer power... for scientific and engineering calculations. Ametek's new concurrent processor puts minicomputer users in the big computer class for small dollars.*

## AMETEK

Paoli, Pennsylvania 19301



*SPUR these executives, these compa-*

*ny head moves within their huge enter-*

*prise after it's called in luxury*

*and labor market.*

*I don't think there is a big problem of a*

*lack of British employment related*

*to the organization's problem more*

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*able to live, including their current chal-*

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*ong those who are leaving attractive em-*

*ployees. These packages would replace se-*

*rietary help them to the company*

*that was sadness but to disillusionment*

*about at ICI which took place from 1981*

*to 1983. Senior managers, many of them men, will*

*offer an environment of stable employment*

*in those lives who do not survive relocation*

*to the outside is even more pernicious. The*

*two counts against them, according to ex-*

*perts and personnel experts: age and*

*with one company their entire lives.*

*Employers often assume that a life, tra-*

*ditions productive, less creative and less*

*ideas. One notable exception is Lee Rad-*

*mond.*

*See LIFERS, Page 19*

**Currency Rates**

**U.S. Dollars**

**Canadian Dollars**

**British Pounds**

**Euro**

**Swiss Francs**

**Deutsche Mark**

**Yen**

**Other Currencies**

**Interest Rates**

**U.S. Money Market**

**Corporate Bonds**

**Treasury Bills**

**U.S. Treasury Notes**

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## BUSINESS ROUNDUP

**LVMH Acquires Cognac Hine**

**PARIS** — The luxury goods company LVMH Moët Hennessy-Louis Vuitton, with a product line ranging from champagne to suites, said Wednesday it had bought a cognac maker, Cognac Hine, from Guinness PLC.

An LVMH spokeswoman said the price was about 300 million French francs (\$50 million). In

June, LVMH and Guinness, the Anglo-Irish brewing company, decided to merge their international distribution networks.

New merges and joint ventures in France's luxury goods industries have accelerated recently as traditional family-owned companies are pressured by increased foreign competition.

LVMH itself is the product of a

June merger that included the champagne houses Moët & Chandon, Dom Pérignon and Veuve Clicquot as well as Hennessy brandy, Christian Dior perfumes and Louis Vuitton luggage. It expects annual revenue of about 13 billion francs.

Hennessy, the world's leading cognac maker, sold 25 million bottles last year. Hine, founded in 1763, sold 2.4 million bottles last year, and has a strong market share in Southeast Asia, the LVMH spokeswoman said.

Recent changes in France's luxury goods industries include Yves Saint-Laurent's sale in July of Charles de Gaulle perfumes to Revlon Inc. of the United States. Louis Vuitton, meanwhile, said last month it is seeking a majority stake in the Givenchy fashion house. It already owns the Givenchy perfume line.

Guinness said that it would retain an association with Hine as existing distribution contracts are to continue and, in addition, it has been appointed the exclusive distributor for Hine products in the duty-free market worldwide, except where distribution is already undertaken by a third party.

The Moët-Hennessy merger with Louis Vuitton this year was valued at about 25 billion francs. The merged company became the sixth-largest concern on the Paris Bourse. Executives have estimated LVMH's profit this year at 1.3 billion francs.

The group's current trading performance was reason to expect similar results for the entire year, if said.

Half-year net profit rose 47 percent to £71.8 million from £48.3 million, while revenue surged 66 percent to £1.20 billion from £721.3 million.

The pretax result was above market forecasts of £55 million and the company's shares rose 3 pence to close at 684 pence on the London Stock Exchange.

**Nokia to Buy Stake in Horda**

*Reuter*

**HELSINKI** — Finland's Nokia Group said it agreed to buy a majority stake in Sweden's Horda AB, which makes technically advanced rubber products. Financial details were not disclosed.

Horda's customers include AB Volvo and Saab-Scania AB, for which it makes rubber products, tire-surfacing materials and special materials for cables.

Horda had estimated sales in 1987 of 250 million kronor (\$39.5 million), a Nokia statement said. Nokia had group sales last year of 12 billion kronor (\$2.75 billion).

Through this deal, Nokia strengthens its position as the second-largest producer of rubber products in Scandinavia, Nokia's president, Simo Vuori-kihti, said Wednesday. "Nokia is now a major supplier for the automobile industry."

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**Canon's Results to Exceed '87 Estimate, Sources Say**

*Reuters*

**TOKYO** — Canon Inc.'s parent company profit is likely to reach 20 billion yen (\$141.3 million) for the year ending Dec. 31 if the yen-dollar exchange rate remains at its present level, company sources said Wednesday.

This estimate is above the official earnings estimate of 18 billion yen. In 1986, Canon earned 13.18 billion yen on sales of \$59.36 billion.

Sales in 1987 are also expected to exceed an earlier estimate of 550 billion yen, the sources said.

The improved forecast is based on higher domestic and overseas demand for copiers and other office equipment and the effects of recent internal restructuring.

Buoyant sales of high-priced new model cameras are also expected to help increase profit, the sources said.

In August, the company reported parent company profit of 3.43 billion yen for the first half, down 66 percent from a year earlier, on sales of 253.98 billion yen, down 8.4 percent.

**LIFERS:****Less Job Security**

(Continued from first finance page)

**Motor Co.** executive, who, late in his career, turned Chrysler Corp. around as chairman.

According to a recent survey by MSL, the British executive placement company, 288 positions advertised in the British press specified an age, and 85.5 percent specified a limit of 40. In one issue of the Daily Telegraph, which advertised 400 such posts, only two specifically sought someone over 45, for a golf club secretary and a clerk for Salisbury Cathedral.

"The most difficult people for us to hire are those in their mid-50s, who have spent their entire careers with one company, and all their experiences are abroad," said Pauline Hyde, of Pauline Hyde & Associates, the London-based placement company in London. "A one-company person has to prove to a new employer that he is adaptable to a new corporate environment."

But there are other views. "On the whole a top executive who has had experience working in two major corporate environments rather than one over 20 years, is a more experienced individual," said David Norman, of Norman Broadbent International, the London placement company. This was the company that in 1980 helped pick the 67-year-old U.S. investment banker, Ian MacGregor, for the No. 1 job at British Steel Corp. "Somebody who has worked in one company can be the creature of one corporate environment and it can be harder for them to move."

Now, some managers are choosing varied careers. "I worked for Royal Dutch/Shell which was a very effective bureaucracy for 20 years," said Otto Boer, 45, who spent his entire corporate career there until two years ago, when he joined BCG, an Amsterdam institution that provides companies with interim managers. "A very large bureaucracy cannot always offer the opportunity that people who want to change things all the time are looking for."

Consolidated, with 26.2 percent of Newmont, also has said it has no plans to acquire more Newmont stock or take over the company.

Analysts said Mr. Pickens wants

Newmont primarily for its valuable gold reserves in Nevada. Newmont also has cash reserves of \$640 million and marketable securities worth about \$600 million.

(AP, UPI)

**Bankers Trust Prepares to Issue New Stock**

By Robert A. Bennett  
New York Times Service

**NEW YORK** — A battle for stock market investors by the biggest U.S. banks has heated up with an announcement by Bankers Trust New York Corp. that it will issue \$250 million in stock.

Bank stocks fared poorly Tuesday, with Bankers Trust taking a particular beating. Its shares lost more than 4 percent of their value.

"The market place has reacted negatively to Bankers Trust's offering, not because it's Bankers but because it's the third issue on a bank stock analyst for Montgomery Securities in San Francisco.

Bankers Trust apparently is expecting some market indigestion and therefore is rushing to beat the other issuers, analysts said.

Because Bankers Trust is in the strongest financial and earnings position, analysts think it can go to market with less of a sales effort than Citicorp or Manufacturers Hanover will need.

A decision by three major bank holding companies to issue new equity could put pressure on other leading banks to follow. Raising equity has become a high priority since earlier this year, when banks decided to take big reserves against their loans to Latin America.

Common stockholders' equity at Citicorp amounts to 2.7 percent of its total assets, and at Manufacturers Hanover to 2.4 percent.

Bankers Trust's equity stands at 4.1 percent of its assets.

**Floating-Rate Notes**

Sept. 9

Dollars

Issuer/Mkt. Coupon/Mat. Bid Asked

Alfred-Perrin Sf 7 Gb 7/26 8/27 8/27

Alfred-Perrin Sf 9 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 10 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 12 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 13 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 14 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 15 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 16 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 17 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 18 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 19 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 20 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 21 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 22 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 23 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 24 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 25 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 26 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 27 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 28 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 29 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 30 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 31 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 32 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 33 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 34 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 35 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 36 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 37 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 38 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 39 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 40 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 41 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 42 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 43 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 44 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 45 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 46 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 47 Gb 7/26 8/27 8/27

Alfred-Perrin Fd 48 Gb 7/



## CURRENCY MARKETS

## Dollar Advances on Short-Covering

Reuters

**LONDON** — The dollar revived Wednesday in late trading, buoyed by nervous short-covering ahead of Friday's U.S. trade figures for July. Currency rates already reflect expectations of a trade deficit of around \$16 billion, dealers said. But any traders who sold dollars they did not yet own after the close that the trade gap could reach \$20 billion were now closing out those positions.

The dollar, said one U.S. bank dealer, "is not going down, so some people are covering a few shorts

London Dollar Rates	
Closing	Wed.
Deutsche mark	1.7920
Dollar sterling	1.4280
Japanese yen	141.45
Swiss franc	1.3870
French franc	5.4700
Source: Reuters	

ahead of Friday." He added that thin trading volumes tended to exaggerate the upward move.

Dealers said they did not notice much central bank intervention in the open market after Tuesday's

coordinated dollar support by European monetary authorities.

In London, the dollar closed higher at 1.7920 Deutsche marks, after 1.7920 on Tuesday, and only slightly lower at 141.55 yen from 141.65.

Just before the close, the dollar was nudging against the psychologically important 1.80 DM level, but eased back.

The British pound slipped against the U.S. currency, to 1.6505 from \$1.6500.

Because of Britain's oil production, the pound often follows the trend in crude oil prices. On Wednesday, dealers said, it came under downward pressure during the afternoon amid evidence that the Organization of Petroleum Exporting Countries was each day producing about 3 million barrels of oil above its official quota. OPEC ministers are meeting in Vienna on Thursday to discuss overproduction.

Congress never ratified the ITO charter, so the elements in it dealing with commercial policy were patched together as the basis of the General Agreement. The GATT treaty is administered by a secretariat in Geneva that now employs about 300 people.

"There is no institution in the world that tries to deal with trade policy the way the International Monetary Fund deals with financial policy," said Julius L. Katz, a retired State Department official and long-time trade negotiator, referring to the IMF's authority to coordinate and enforce member countries' obligations.

Mr. Katz now heads a group of international officials charged with strengthening GATT's policy role through the talks and by revamping GATT's dispute settlement procedure.

But Mr. Choate and Mr. Prestowitz say that the problem is too serious to be righted by any tinkering. Both argue the preva-

## GATT: As U.S. Fights to Revive the Free Trade Code, Many Say Reality Has Killed It

(Continued from first finance page)

lition of protectionism in the U.S. has been triggered by the U.S. Congress.

The community, exercising its veto rights under the GATT system, then blocked adoption of the panel report, and spent the next four years in on-and-off negotiations with the United States that also involved a separate dispute over citrus products. During this period European pasta imports to the United States nearly tripled. The case was partly settled earlier this month, almost six years after it began, for a fraction of what the American negotiators originally sought.

To some extent, these problems are aggravated by the schizophrenic nature of GATT itself. Part organization and part treaty, GATT is the remnant of what postwar U.S. policymakers had envisioned as something called the International Trade Organization, a body that would regulate trade relations and encourage trade liberalization.

The belief that Britain might be preparing to enter the exchange rate mechanism of the European Monetary System was also depressing the currency, as membership could limit its upward potential.

In New York at midday, the dollar was confirming the European trend, and traded at the day's high.

The Japanese central banker said the country would continue its current monetary policy while maintaining measures to prevent excessively easy credit conditions from causing inflation. He said other central bank governors consented to this policy.

A change in the U.S. discount rate is among factors the Bank of Japan takes into account, he said.

In Zurich, the dollar closed lower at 1.4840 Swiss francs, after 1.4857.

## Sumita Says Central Banks Backed Currency Cooperation

Reuters

**TOKYO** — Central bank governors reaffirmed their determination to cooperate to stabilize exchange rates when they met in Seoul earlier this week, the Bank of Japan governor, Sotando Sumita, said Wednesday.

Mr. Sumita, speaking to journalists after attending the meetings at the Bank for International Settlements, also repeated that Friday's decision by the United States to raise its discount rate by a half point to 10 percent would not immediately change Japan's monetary policy.

He welcomed the U.S. rate increase, saying it would contribute to exchange rate stability and help fight inflation.

Mr. Sumita declined to provide many details of the BIS discussions, which took place amid speculation that the U.S. currency's weakness might force the central banks to lower the minimum trading level

for the dollar against other currencies.

Officials from West Germany and Japan have recently confirmed that agreements on approximate dollar trading ranges emerged from discussions earlier this year on currency stability. These talks were highlighted by the so-called Louvre accord reached in February by six major industrialized countries.

Mr. Sumita said he had told central bank governors that there have been increasingly clear signs of recovery in Japan's economy.

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Willy De Clercq

## De Clercq Likens Disputes To Protectionism of 1930s

Reuters

**MOUNT FUJI**, Japan — Current protectionist pressures are potentially as dangerous as a wave of restrictive trade laws that contributed to the start of World War II, the European Community's external affairs commissioner said Wednesday.

"Let me assure you that the fallout from a wave of protectionism would also be a global event," said Willy De Clercq, who is in Japan for trade talks.

"Do not forget: Protectionism and unemployment, which went hand in hand during the 1930s, contributed substantially to the destabilization of Europe, and to the outbreak of the war," he said.

To some extent, these problems are aggravated by the schizophrenic nature of GATT itself. Part organization and part treaty, GATT is the remnant of what postwar U.S. policymakers had envisioned as something called the International Trade Organization, a body that would regulate trade relations and encourage trade liberalization.

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But Mr. Choate and Mr. Prestowitz say that the problem is too serious to be righted by any tinkering. Both argue the preva-

lition of protectionism in the U.S. has been triggered by the U.S. Congress. A member country should treat its trading partners in a nondiscriminatory fashion, a concept known as Most Favored Nation. But that does not rule out trade restrictions.

"Korea may be restrictive toward Canada," he noted, "but it can comply with MFN rules by treating the United States the same way. In other words, under GATT, a restrictive country can be restrictive to everybody."

One of the most pervasive problems in GATT is its inability to deal with the agricultural subsidies that have come to dominate world trade. Cases involving such subsidies have been the source of bitter fights between the United States and the European Community, dramatizing both the flaws in the procedures for settling disputes and some very fundamental differences in the way these two major trading partners view GATT's role of GATT.

"GATT is not a court of law, it is 94 countries with sovereignty," said Sir Roy Denman, a veteran trade negotiator who heads the Washington delegation of the European Commission, the EC's executive body.

But Mr. Yettner said that GATT must find a more rapid and decisive way of settling trade disputes if it is to survive. "The EC always wants GATT to be a political body, never a binding court," he said. "We've been telling them that we don't have 10 to 12 years to reach a consensus on disputes, that will be perceived by the business of the world as a farce and that GATT will lose its credibility as an institution and die."

Australia, which has no export subsidies on its agricultural products, has joined Canada, Argentina and 11 other nations in leading a fight within the GATT to halt all agricultural subsidies.

As an example, Mr. Prestowitz pointed to the GATT principle that

the reform panel, in what was apparently an unconscious, but wickedly apt, parody of the GATT bureaucracy, is officially known as FOOGs, for Functioning of the GATT System.

"What we are trying to do is give GATT more the character of a functioning trade organization," Mr. Katz said. "It has been a bureaucratic body, represented at the official level rather than the ministerial level, and we would like to have a ministerial-level steering group. The world's finance ministers meet several times a year through the IMF and various subgroups, but they look at economic policy. Trade policy is always the residual."

The politics have been sometimes confusing, the practical results have been disastrous, according to critics. "We engage in the charade," Mr. Prestowitz said, "that all GATT members share the same goals and that the American market was made open to the world without opening the world market to us."

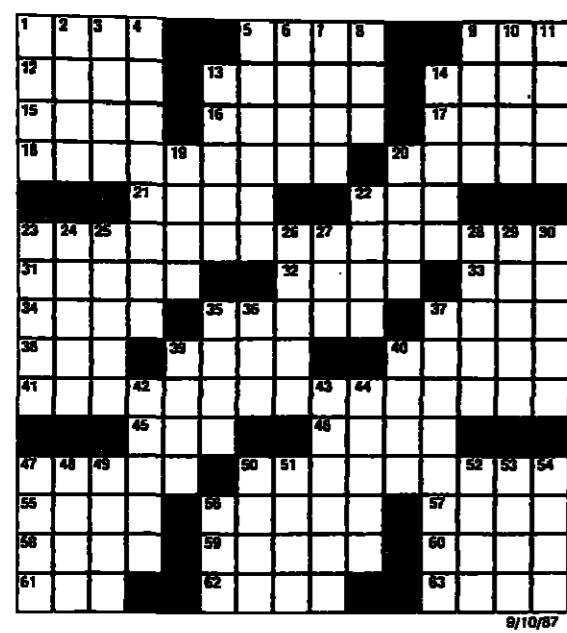
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## Wednesday's OTC Prices

NASDAQ prices as of 3 p.m. New York time.  
Via The Associated Press

12 Month High Low Stock	Div. Yld.	Sales In 1M	High	Low	3 P.M. Chg.	Net	12 Month High Low Stock	Div. Yld.	Sales In 1M	High	Low	3 P.M. Chg.	Net	12 Month High Low Stock	Div. Yld.	Sales In 1M	High	Low	3 P.M. Chg.	Net
A																				
ABC	.00	1.20	1.20	1.19	+ .00	-	ABE	.00	1.20	1.20	1.19	+ .00	-	ABF	.00	1.20	1.20	1.19	+ .00	-
ABG	.00	1.20	1.20	1.19	+ .00	-	ABH	.00	1.20	1.20	1.19	+ .00	-	ABJ	.00	1.20	1.20	1.19	+ .00	-
ABK	.00	1.20	1.20	1.19	+ .00	-	ABL	.00	1.20	1.20	1.19	+ .00	-	ABL	.00	1.20	1.20	1.19	+ .00	-
AST	.00	1.20	1.20	1.19	+ .00	-	ATB	.00	1.20	1.20	1.19	+ .00	-	ATC	.00	1.20	1.20	1.19	+ .00	-
ATD	.00	1.20	1.20	1.19	+ .00	-	ATF	.00	1.20	1.20	1.19	+ .00	-	ATG	.00	1.20	1.20	1.19	+ .00	-
ATI	.00	1.20	1.20	1.19	+ .00	-	ATL	.00	1.20	1.20	1.19	+ .00	-	ATM	.00	1.20	1.20	1.19	+ .00	-
ATM	.00	1.20	1.20	1.19	+ .00	-	ATN	.00	1.20	1.20	1.19	+ .00	-	ATP	.00	1.20	1.20	1.19	+ .00	-
ATR	.00	1.20	1.20	1.19	+ .00	-	ATU	.00	1.20	1.20	1.19	+ .00	-	ATV	.00	1.20	1.20	1.19	+ .00	-
ATY	.00	1.20	1.20	1.19	+ .00	-	AVB	.00	1.20	1.20	1.19	+ .00	-	AVC	.00	1.20	1.20	1.19	+ .00	-
AVD	.00	1.20	1.20	1.19	+ .00	-	AVF	.00	1.20	1.20	1.19	+ .00	-	AVG	.00	1.20	1.20	1.19	+ .00	-
AVH	.00	1.20	1.20	1.19	+ .00	-	AVI	.00	1.20	1.20	1.19	+ .00	-	AVL	.00	1.20	1.20	1.19	+ .00	-
AVM	.00	1.20	1.20	1.19	+ .00	-	AVN	.00	1.20	1.20	1.19	+ .00	-	AVP	.00	1.20	1.20	1.19	+ .00	-
AVT	.00	1.20	1.20	1.19	+ .00	-	AVX	.00	1.20	1.20	1.19	+ .00	-	AVY	.00	1.20	1.20	1.19	+ .00	-
B																				
BAE	.00	1.20	1.20	1.19	+ .00	-	BAE	.00	1.20	1.20	1.19									



**ACROSS**

- 1 Subsidies
- 5 City on the Aar
- 9 Goat's offspring
- 12 Ivy League school
- 13 Fattened rooster
- 14 Hardy's "The Obscure"
- 15 Essayist
- 16 Carroll's cousin
- 17 Author
- Gardner
- 18 First word of an Isaac Goldberg quote
- 20 Door sign
- 21 "Henry VI," character
- 22 Jug's kin
- 23 Quote: Part II
- 31 Farm structures
- 32 Menacing March day
- 33 Magician's name
- 34 Takes to court
- 35 Called by loudspeaker
- 37 Corn dish
- 38 Chemical suffix
- 39 Luxurious
- 40 Subordinate

**DOWN**

- 1 Ogled
- 2 Indonesian
- 3 Radar-set image
- 4 Eared pimplined
- 5 Tropical fruit
- 6 Noyes' "Drake," e.g.
- 7 Blushing
- 8 Compass dir.
- 9 Author Vonnegut
- 10 Still
- 11 Forest animal
- 12 Carved gem
- 14 Swedish soprano Lind
- 19 They're played in Reno
- 41 Quote: Part III
- 45 Hill dweller
- 46 Abate
- 47 Lax
- 50 Quote: Part IV
- 55 Actor Douglas
- 56 Beat
- 57 Atop
- 58 TV award
- 59 Leans
- 60 A lunチtime
- 61 End of quote
- 62 Confederate
- 63 Descri
- 20 Time periods
- 22 Like some cars
- 23 "A Doll's House" playwright
- 25 Spa feature
- 26 "The — of the Iguana": Williams
- 27 Presidential initials
- 28 Whiplash
- 29 Asian city
- 30 Forever, in poesy
- 35 Byron, e.g.
- 36 Buridan's vacillator
- 37 Forest dropper
- 38 Panther style?
- 40 Skirt style
- 42 Not neat or stylish
- 43 Jackson bill
- 44 Clock parts
- 47 Twist
- 48 Tall-growing bean
- 49 Troops
- 50 Labor
- 51 Ship's frame
- 52 Son of Seth
- 53 "Bus," Inge play
- 54 Actor Curtis
- 56 School org.

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### DENNIS THE MENACE



"CAREFUL! REMEMBER, I'M DOWN HERE WHERE THE OOPS LAND!"

### JUMBLE

Uncramble these four Jumbles, one letter to each square, to form four ordinary words.

**KLANF**

There they go again — that's their only reason!

**IBBER**

OO

**GLEGGI**

OO

**YAFFOL**

OO



Print answer here:

(Answers tomorrow)

Yesterday's Jumble: PROVE GRAVE AFFRAY ROTATE

Answer: Looks like a bad sign—FORGERY

### WEATHER

EUROPE		HIGH	LOW	HIGH	LOW	HIGH	LOW
Aberdeen	51	54	70	52	52	52	52
Amsterdam	51	54	74	52	52	52	52
Athens	51	54	74	52	52	52	52
Berne	51	54	74	52	52	52	52
Brisbane	51	54	74	52	52	52	52
Buenos Aires	51	54	74	52	52	52	52
Copenhagen	51	54	74	52	52	52	52
Caracas	51	54	74	52	52	52	52
Colombia	51	54	74	52	52	52	52
Dublin	51	54	74	52	52	52	52
Eddisbury	51	54	74	52	52	52	52
Florence	51	54	74	52	52	52	52
Freiburg	51	54	74	52	52	52	52
Glasgow	51	54	74	52	52	52	52
London	51	54	74	52	52	52	52
Lyon	51	54	74	52	52	52	52
Milan	51	54	74	52	52	52	52
Moscow	51	54	74	52	52	52	52
Munich	51	54	74	52	52	52	52
Naples	51	54	74	52	52	52	52
Oslo	51	54	74	52	52	52	52
Paris	51	54	74	52	52	52	52
Premier	51	54	74	52	52	52	52
Rome	51	54	74	52	52	52	52
Saint Petersburg	51	54	74	52	52	52	52
Salzburg	51	54	74	52	52	52	52
Stockholm	51	54	74	52	52	52	52
Turin	51	54	74	52	52	52	52
Vienna	51	54	74	52	52	52	52
Wiesbaden	51	54	74	52	52	52	52
Zurich	51	54	74	52	52	52	52
<b>MIDDLE EAST</b>	51	54	74	52	52	52	52
Ankara	51	54	74	52	52	52	52
Beirut	51	54	74	52	52	52	52
Cairo	51	54	74	52	52	52	52
Jerusalem	51	54	74	52	52	52	52
Tel Aviv	51	54	74	52	52	52	52
<b>OCEANIA</b>	51	54	74	52	52	52	52
Auckland	51	54	74	52	52	52	52
Sydney	51	54	74	52	52	52	52
Tarawa	51	54	74	52	52	52	52
Wellington	51	54	74	52	52	52	52
Zürich	51	54	74	52	52	52	52

THURSDAY'S FORECAST — CHANNEL: Chevy. FRANKFURT: Rainy. Temp: 18 — 64 — 51. LONDON: Showers. Partly cloudy. Temp: 27 — 58. PARIS: Partly cloudy. Temp: 21 — 12 (20 — 54). ROME: Partly cloudy. Temp: 20 — 58 (22 — 64). TEL AVIV: Not available. Temp: 24 — 70 (55 — 81). HONG KONG: Cloudy. Temp: 27 — 24 (58 — 70). MANILA: Showers. Temp: 20 — 70 (55 — 75). SEOUL: Cloudy. Temp: 25 — 17 (59 — 63). SINGAPORE: Showers. Temp: 21 — 24 (59 — 73). TOKYO: Partly cloudy. Temp: 21 — 24 (59 — 77).

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from Guebels' own diary. Michael's high-flown manner, and the writing proceeds by thematic fits and starts.

Many entire paragraphs are lost.

Or are even as short as this:

From the reader's point of view, the tape has its advantages. It has been indispensible and had in some cases comparatively easy to "shorten," in fact punches its points home more effectively than according to me to expect. But it is longer, smaller doses, and for the most part ret - which is considerable - he reveals about the author, and above all Nazi mentality in general.

There are only three short paragraphs over an unnamed Führer, a topic that might be called "Nazism." In two of them, Michael writes over an unnamed Führer, a topic that might be called "Nazism."

It is impossible to prove beyond a shadow of a doubt that this was published in 1929, but everything here being interpretations. When he does give a particular sign of development, certainly not a bad one, extremely nihilistic - an all-call for national regeneration and the overthrow of existing institutions. But there are clear-cut themes, above all the concept in which "labor is marching on."

"Bourgeois" is a dirty word, and Michael rejects Marxism, but shows admiration for Lenin.

In large measure, however, what is left is not so much a set of beliefs as a set of attitudes. All the concepts are thrashing around, clawing their way to the surface. He says this:

"I kept the pressure on," said

Guebels, who had not yet met Michael.

Much of the political talk is extremely nihilistic - an all-call for national regeneration and the overthrow of existing institutions. But there are clear-cut themes, above all the concept in which "labor is marching on."

"Bourgeois" is a dirty word, and Michael rejects Marxism, but shows admiration for Lenin.

Management left us no choice but to set a strike date," said Gene Upshaw, the executive director of the players' union. Representatives from all 28 teams were there Tuesday and, Upshaw said, unanimously favored a strike if a contract could not be concluded. The vote for a deadline after the second game, Upshaw said, was 24 to 4.

Upshaw said that an offer presented to the players by the league's management committee on Monday represented \$43 million in "givebacks" that the team owners wanted the players to surrender.

He said the union's detailed analysis of the "givebacks" would be forthcoming.

Jack Donlan, the negotiator for the owners, said of the strike threat: "It's not unexpected. It conforms to their history. The history of this union is to put negotiations in crisis. They've never negotiated without a strike. Now that we know

what their strike agenda is, what is their bargaining agenda?"

But Donlan did not rule out the possibility of reaching an agreement without a strike, saying he hoped to resume negotiations on Friday. "I anticipate no great delay in resuming meetings," he said.

The current contract, which expired Aug. 31, was reached after a 57-day strike in 1982.

Upshaw did not rule out a dead-

line against the pad.

He then entered with a club and the diamond was cut.

He pointed to the pad.

He pointed to the pad.</p

## ART BUCHWALD

**The \$75,000 Diploma**

**WASHINGTON —** Word from the old alma mater is that the price of private education is going up faster than the U.S. national debt. A recent College Board survey revealed that the price of a diploma at one of the more expensive schools is now \$75,000, which does not include gas, oil or ski trips during the school break.

Can parents afford to send a kid to college for \$75,000 and still find happiness? The answer is most people can't afford to send them for half of that. And yet for some reason the older generation continues to do it.

Thanks to their own sacrifice, parents are making the payments and their children are growing up in the rich academic environment everyone has told them they are entitled to.

In order to get a better picture of what exactly is going on I talked to those involved in the tuition struggle to see how they felt about it.

One student at Georgetown University took the news calmly. "Nobody wants to force our parents to come up with \$75 big ones, but if that's the price we young Americans have to pay for a good education, I say it's money well spent. Dad had it easy when he went to college so he never knew the cost of the diploma. Now he's learning the hard way."

The drama concerning heavy tuition is being played out everywhere. I saw a father at Johns Hopkins say farewell to his son at the gate. As he bade him goodbye, he



father gave the young man his cuff links, tie clasp and gold watch. "This is it," the father told the boy. "When they are gone you're on your own."

"Where will I find you?" the boy asked.

"Our mother and I will be in the basement of a federal housing project in Baltimore. Don't worry, the move has nothing to do with your tuition. We always planned to do it that way."

A president at one of the Ivy League schools defended the high-priced costs and said that \$75,000 hardly pays for books and a half-baked history teacher.

"It's wrong," he said, "to use the figure \$75,000 as the cost of a four-year education, because everybody will expect one for that. We have a different plan at our school. We insist that parents throw everything they have in our great roundouts and allow the school to take what it needs."

That would be a fair way of doing it," I said.

"Parents think we make money on \$75,000 million. There is no way we can get in the black by filling our classrooms," the president said.

"We don't even make a profit on Shakespeare."

"What do you make money on?" I asked.

"Towing students' cars away. If it weren't for our police tow-away program we would never have been able to construct a new science building."

The final person I spoke to was a football player attending a great Texas university.

"How do you feel about a college education costing \$75,000?" I asked him.

"I don't think that's a lot of money to pay a linebacker. After all, we have given up a great deal to play football for our school."

"I believe you misread me. The student is expected to pay the school, not the other way around."

"Why would a college football player want to pay the school anything?" he asked.

"Perhaps to get a better education."

"I'd rather see the \$75,000 go into new shoulder pads, where it belongs."

## Malle Film Wins in Venice

United Press International

**VENICE —** The French film "Au Revoir, les Enfants" directed by Louis Malle, won the Golden Lion first prize Wednesday at the 44th Venice International Film Festival. The second prize Silver Lion was shared by Italian director Ermanno Olmi's "Lunga Vita alla Signora" and "Maurice" by British director James Ivory.

The drama concerning heavy tuition is being played out everywhere. I saw a father at Johns Hopkins say farewell to his son at the gate. As he bade him goodbye,

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GERMANY: 030 55 18 000

SWEDEN: 020 795 67 00

SWITZERLAND & LIECHTENSTEIN: 0460 5 1800

United Kingdom: 0800 55 1800

Denmark: 0454 0300

France: 01 50 09 1800

Germany & Berlin: 01 30 29288

Netherlands: 06 023 2928

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